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Electrical Contracting

With Which Is Consolidated

Electrical Record

ELECTRICAL CONTRACTING NIRA CODE

HEARING SET *for* SEPTEMBER 6

Details of Revised Code On Page 13

UMI

A Fuse . . . Like a Parachute MUST BE RIGHT

ELECTRICAL equipment in even the small plant runs into considerable money. Hence, it is important that it be protected by "time-tried" safe fuses. Like a parachute, a fuse is a last resort—*must* be right, for safety.

Jefferson (Union) Fuses provide *proven* protection and for over 40 years have been the accepted standard by which safe protection is measured.

Examine a Jefferson Fuse and you will understand—they are extra rugged, simple, accurate, easy to renew and SAFE.

Get Free Fuse Chart

Tells at a glance right capacity fuse to use for adequate protection of all power and light circuits. Ask for your copy.

Play safe yourself—use and recommend proven protection — Jefferson Fuses.

Jefferson knife-blade type. Simple—only three units. Rugged—withstands repeated blowouts. Saves time—only one loose end-cap, studs need not be removed—only loosened.

Jefferson Electric Company

Bellwood - (Suburb of Chicago) - Illinois

JEFFERSON UNION RENEWABLE FUSES

VOLUME 32
NUMBER 11

electrical contracting

WITH WHICH IS CONSOLIDATED ELECTRICAL RECORD

S. B. WILLIAMS, EDITOR AND GENERAL MANAGER

PUBLISHED MONTHLY

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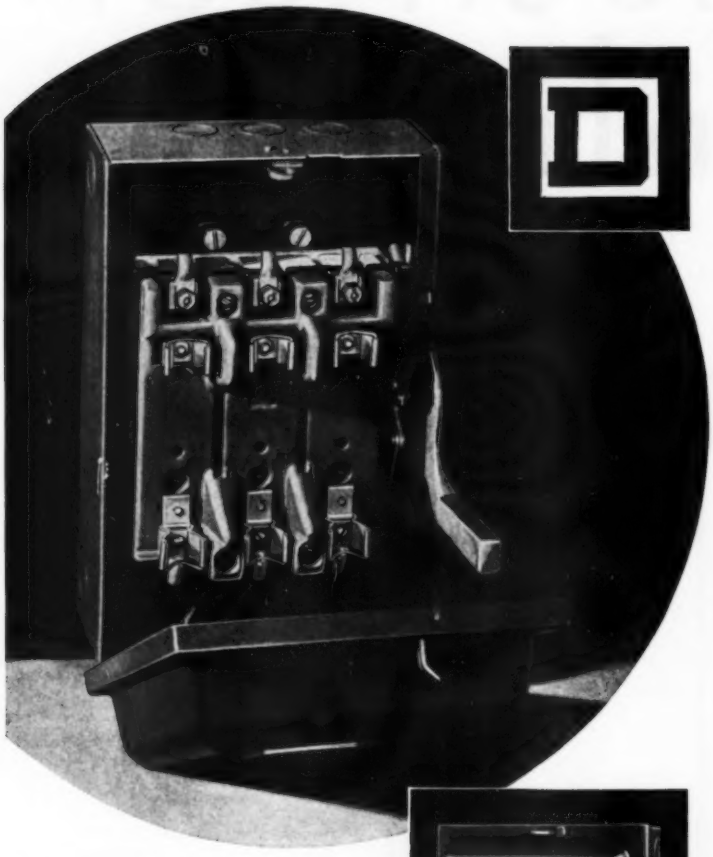
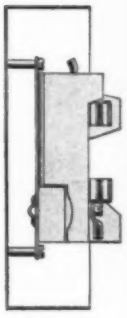
UMI

GREATER WIRING SPACE MEANS LOWER WIRING COST



The large amount of space available for wiring in this new switch, is shown by the white area of the outline illustration at the right.



The New Square D Switch "50,000 Series" Small Outside—Large Inside

•

The Elevated Base Gives the Switch Triple Wiring Area

•

This new switch is easy to sell and easy to install. Its modern, exterior design is a sales asset, and its extra wiring space makes installation a simple, easy job... Look at the switch mechanism! It's elevated on four studs and leaves the entire back of the box empty for wiring. That means no threading of wires—no danger of pinching. The switch mechanism is removable as a unit by loosening four screws—get that, loosening, not removing.

These switches have front operation, complete interlock and are quick make and quick break. Square D Positive Pressure Fuse Clips are used. Knockouts are available on all four sides. And in this new switch we reduce heating 60% by positive contact pressures, that are assured by the use of copper blades, reinforced by resilient, rust-resisting steel springs—and in addition to all that, it's neat and very good looking.

SQUARE D COMPANY

ELECTRICAL EQUIPMENT

SWITCH AND PANEL DIVISION

6060 RIVARD ST., DETROIT, MICH.

Our Part

WHAT is going to be the effect of the several NIRA codes under which the different branches of the electrical industry will soon be operating?

The codes will undoubtedly bring about improved conditions of competition, but will they help to improve the business of those industries which have signed them?

THERE seems to be a disposition on the part of some people to question the workableness of these codes and to generally criticize the work of NRA. Thousands of others, while not openly critical, are nevertheless "from Missouri." They must be shown.

This attitude, while natural, is nevertheless rather dangerous because it is so passive. A passive do-nothing attitude can be the greatest obstacle to the successful operation of any program.

Only seven months have elapsed since President Roosevelt took office and in that time we have seen tremendous changes forced upon American business. These changes came because business, helpless to help itself, was endangering the livelihood of the American people.

There is no question but what business has improved since the government intervened, but we greatly suspect that business men encouraged by a return of business have forgotten their own too recent impotency and are now regretful of their choice of overlord.

AS we see the reports of increasing reemployment, we ask if there is going to be a corresponding increase in spending. That is not something the government can legislate.

Industry alone has the answer to that question.

Thousands of the people who have been unemployed for a long time have had to dispose of many of the things that they formerly owned. They will want these things back but they are going to need urging to buy.

ELECTRICAL CONTRACTING sees an opportunity for the electrical industry to help cure itself of the depression. The manufacturers' code now in operation, the contractors' code, approval of which is imminent, and the wholesalers' code about to be presented to NRA, are merely protective in that they are designed to protect one against unfair competition. They do not assure anyone a bit more business.

It is possible, however, by a united effort of the entire electrical industry to concentrate upon the increased income of the American public and direct a larger share of it to electrical products.

THE electrical industry cannot stand still now that it has approved codes. They are but the beginning. The industry must help itself if it is to make a successful recovery. To do nothing but wait for orders is merely to invite a return of the depression with far worse consequences than ever.

Is it not possible for the industry to set up a central trade-promotion organization? Suppose there have been jealousies in the past, is not the need of the moment intense enough for us to forget the past and try to work together for the future?

We have been urged before to do this very same thing in a spirit of unselfish cooperation. ELECTRICAL CONTRACTING now urges the industry to be selfish—to look out for its own interests.

A spirit of self-interest cooperation is today's need. Let us get together to help ourselves with the understanding that none of us will get very far unless we do work together.

And in so doing we will live up to the spirit of the Blue Eagle—doing our part—for by the creation of business will we increase employment and wages on a natural and economically sound basis.

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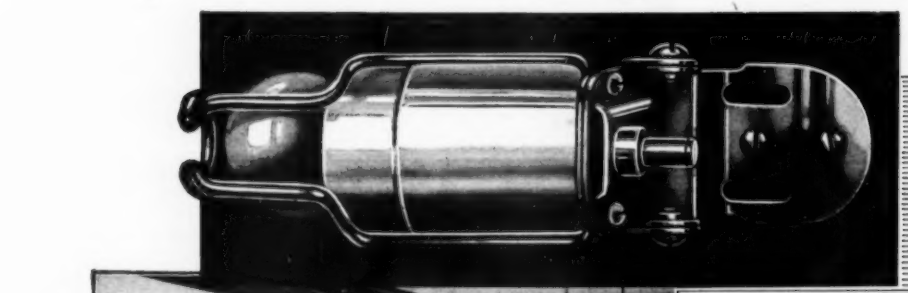
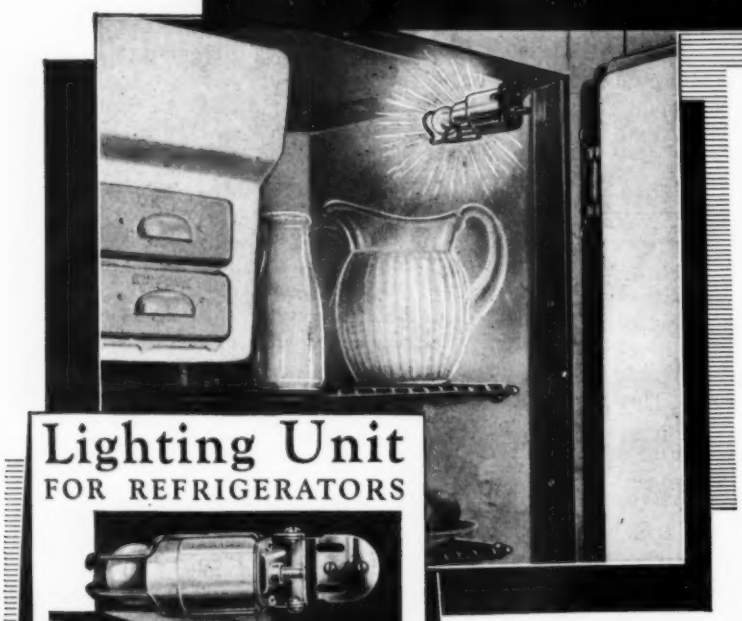
H&H NEW LIGHTING UNIT
for all Refrigerators





Provides INSIDE LIGHT *when door is open*

FITS ALL MAKES OF BOXES-
TAKES STANDARD MAZDA LAMPS

ALL refrigerators bought before this development— and new low-priced boxes not equipped—make a large-size market for the H a H Lighting Unit. Door switch automatically lights contents of box when door is open; shuts off when door is closed. Adjustable bracket takes care of door jamb strips set at any angle, and allows horizontal adjustment of the light.

Besides being a *directly* profitable item, an installation of the Lighting Unit gives you a "LEADER" for getting into homes to secure *additional* wiring jobs. Specify No. 6872 for 7½-Watt standard base lamp; No. 6873 for 15-Watt standard base lamp. » » » » » » »

TO SELL these Units they *MUST BE DISPLAYED.* Complete Counter Display will be included with each order for 10 Units. The Display is for use on your Store Counter or for *demonstration* in your customers' homes. » » » » » »

HART & HEGEMAN DIVISION
THE ARROW-HART & HEGEMAN ELECTRIC CO. HARTFORD, CONN.

VOLUME 32
NUMBER 11

electrical contracting

WITH WHICH IS CONSOLIDATED ELECTRICAL RECORD

SEPTEMBER
1933

FOLLOW THE PRESIDENT

BY JOHN WISE

The Roman Empire was plenty sick—moaning and tossing in pain from a cross between horse-colic and locomotor-ataxia. In fact, when Marcus Aurelius slid behind the steering wheel in 161 A. D., it was three to one the nation would bust wide open right in his face. Marc was a hustler and knew he had the answer, but he also knew he wouldn't get to first base without solid backing from the masses.

So he promptly got on the radio. "Hello, fellow citizens," says he, "I just thought you'd like to know what kind of a so-and-so the new Emperor is. Well, I'm in here swinging for the team, but we can only make the grade together. You all know the fix we're in. Business is shot, the people are eating last year's shoes and the banks are paying off in cigar coupons. Foreign debtors are handing us the bird, and our enemies are getting tough because they know we can't feed our soldiers, let alone pay 'em. So we must first clean house and get back on the three-meal standard, and if we don't pull together we'll soon be the guests of honor at a Barbarian Barbecue. Back my play 100 per cent and we can't lose. Let's go!"

From every corner of the Empire came the "highball" for full speed ahead, and Marc made good. Working 18 hours a day, he reorganized everything, finance, law, labor and transportation. He cut government expense in two and built roads with the savings. He gave the common people their rights and put over laws to protect children. Best of all, he restored local and foreign trade by drastic regulation. When some of the big shots who still wanted it all threw wrenches, he sent out his Legions and slapped 'em over. Also, when conditions improved, he bobbed up with a new Army and Navy and made bums of the would-be invaders.

History repeats itself. In 1933 A. D., with our team a million runs behind and two strikes on him, President Roosevelt stepped up to the plate and knocked the ball out of the park. He has been blessed with success because he is pledged to the doctrine of greatest good to the greatest number, knowing it to be our only hope.

You who read this belong to a great industry which is highly important in the scheme of human comfort and efficiency. By unselfish and whole-hearted co-operation, you can aid materially the National plan for restoring sound business and its inseparable mate, prosperity. If electrical contractors, collectively and individually, will forget petty difficulties and keep their vision trained on the ultimate result, they will be amply recompensed when the trumpet of victory sounds the pay-off.

Climb on the N.E.C.A. band-wagon — we're going places!

UMI

Better Lighting

The Store

1. The eyes are the real buyers. Do your prospects' show windows attract buyers? Can they examine the material within the store with comfort and ease?

2. Some goods are sold by the sense of smell, some by taste, and some by touch. Think a minute, however, and see if you do not come to the conclusion that these three senses are not in it with the sense of sight.

3. The store owner is in keen competition with stores selling the same produce as he, in addition to those who sell other types of merchandise. Everyone is competing for his share of the consumer's dollar. When you stop at a store to make a purchase, see if light and sight have not had considerable to do with making up your mind.

4. Plenty of light places the name of a store and its product before people. Stops a high percentage of the pedestrians who pass its windows each day. Creates the urge to own some of the products displayed in its windows. Conveys the thought that there are additional interesting things to see inside of the store. And brings customers inside. Light—eyes—sales and profits—they are inseparable.

The Office

1. A Babson Report contains these words — "Clerks in many offices will increase their output if they are given more light. Although American business offices are on the whole well illuminated, yet recent tests have shown that *doubling the artificial light would earn, through speedier work and decreased mistakes, at least ten times the extra cost for electricity.* Four thousand tests of speed and accuracy in typing from printed copy and in transcribing shorthand notes indicated that straight typing would be increased at least 10 per cent by additional lighting, and transcribing output would be stepped up 20 per cent. Work requiring still more accurate use of the eyes, like bookkeeping, filling out blanks, searching through indices, or drafting of any kind would be still further speeded by plenty of light."

2. Present lighting costs from a quarter to one-half of one per cent of total office expense (rent, office supplies, telephones, salaries, etc.), yet illumination affects every phase of office efficiency. The use of higher levels of illumination gradually improves the visual acuity of the workers, and reduces ocular fatigue.

The School

1. Fifty to eighty per cent of our education is acquired through the sense of sight. Is not the subject of good schoolroom illumination a matter of more than academic interest? In Tuscumbia, Alabama, for instance, a test proved what light means to the student. In one room equipped with two 150-watt lamps there were eleven failures out of 34 students; 68 per cent being promoted. In another room equipped with four 300-watt totally-indirect units and controlled by a photo electric cell, there were only 2 failures out of a class of 36 pupils; 94 per cent being promoted. With the exception of the lighting, the physical effects of the two rooms were identical as was

UMI

for Better Seeing

By Dean M. Warren
General Electric Company
Nela Park Engineering Department
Cleveland, Ohio

IS the motive back of the electrical industry's promotion of the sale of larger wattage lamps one of selfishness, or are there fundamental scientific truths to justify a high level of illumination? Recent researches clearly indicate a definite relationship between light and vision. The lighting man of today must become the seeing specialist of tomorrow, if he is to progress with the times and know the answer to the question—Why a bigger lamp?

Seeing is a partnership of lighting and of good or corrected vision, and so today when the contractor, a future seeing specialist, approaches a customer, it should be on the basis of selling him better seeing.

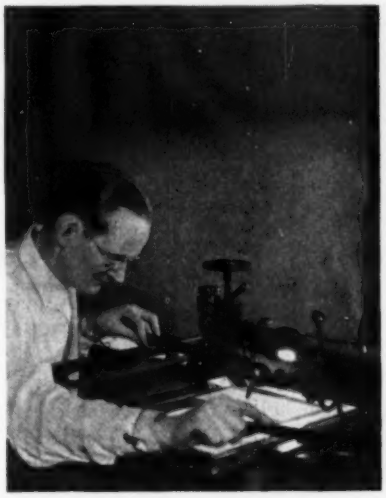
The following are a few salient sales points that will serve as ammunition:

1. A noted physician has stated that 60 per cent of eyes are so defective as to cause ill health, reduced efficiency, or poor eyesight.

2. Eyestrain is one of the most widespread of all eye troubles and is responsible for more discomfort and disability than all other eye troubles combined. Insufficient light results directly in eyestrain which is a contributing factor in the development of defective vision.

3. Inadequate or glaring light is many times responsible for headache, vertigo, blurring vision, digestive disturbance, etc.

4. It is a generally accepted fact that more and better lighting improves visibility, makes visual work easier, reduces eyestrain and fatigue, and enables a greater proportion of the energy available for work to be converted into useful work.



The Factory

1. Good lighting helps those who need help most. Here are results of a laboratory test. Levels of illumination increased from 3 to 12 footcandles.

Groups	Percent Increase in Rate of Working
With better eyes	14
With poorer eyes	22
Fast workers	28
Slower workers	40

2. Improved seeing requires higher levels of illumination. Don't forget, however, that as seeing specialist the elements of quality, control, direction, surroundings are part of your problem, and require an intelligent selection of reflecting and diffusing equipment, and their proper location.

3. Good lighting is an investment, not an expense. Today's lighting in our industries represents but 0.3 per cent of the total manufacturing cost. It's so insignificant it takes a magnifying glass to find it among the other costs.

---

the mental calibre of the two groups of students.

A saving of $77.65 was effected. This resulted through a comparison of the additional cost for electricity and equipment as against the cost for having the failures repeat.

2. Bulletin 7 of the Eyesight Conservation Council states "Simple visual acuity tests reveal that 25 per cent of the schoolroom children in the United States have manifest defects of vision and symptoms of eyestrain."

3. At the age when most children start to school, it is probable that not over 5 per cent of them have defective vision. By the time they have finished their public school course, however, surveys reveal that an additional 20 per cent have acquired eye defects.

4. Bulletin 7 of the Eyesight Conservation Council further states: "If each of the six million retarded children in the United States were to drop back only one year, the cost to the country would be $390,000,000. At least one-third of this amount, or $130,000,000, is lost annually because the eyesight of the children is neglected.

5. The cost per pupil enrolled for elementary and secondary schools amounts to $86.77. In a typical large city the actual lighting cost per pupil amounts to 63 cents, or less than 1 per cent per pupil.

6. The 1931 edition of the Statistical Abstract of the United States revealed that throughout the 10 months of the school year, the percentage of possible sunshine throughout the 48 states of the Union amounts to only 58 per cent. Obviously, therefore, artificial lighting is an absolute necessity, if satisfactory seeing conditions are to be provided for the student group.

7. Lighting is far too important and far-reaching in its effects to be appraised merely as a budget item, to be restricted when school costs are being scrutinized.

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Day View
A small store chosen at random as a typical opportunity for planning renovation with light.

3 Suggestions

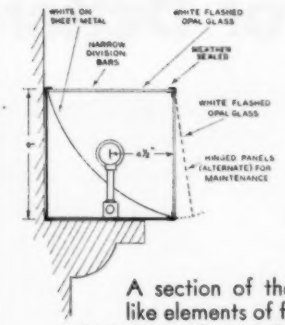
for renovizing stores with light

RENOVATION of store fronts with light offers a new market of considerable size to electrical contractors. The average small store cannot afford to hire an architect but is sadly in need of a new and attractive dress. By means of light panels and illuminated signs it is possible easily to dress up a store front.

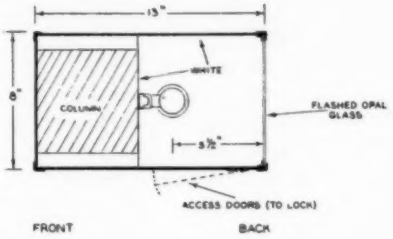
The three suggested treatments for an average small store front shown here were made by the Engineering Department of the General Electric Company, Nela Park, Cleveland. It is apparent that much can be done, yet simply. The changes are essentially lighting design.

Dimensions and wattages given in this article are estimated and approximate, except that for units of the size given, the positioning of lamps can be determined from the dimensions. More specific information is given in "Luminous Architectural Elements," a bulletin prepared by The Nela Park Engineering Department.

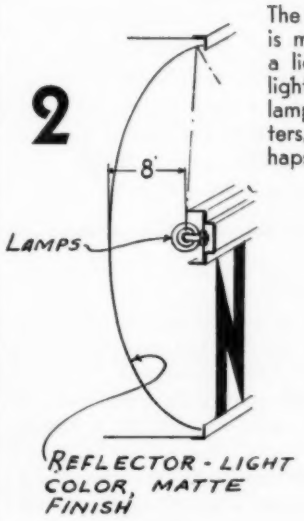
Night View



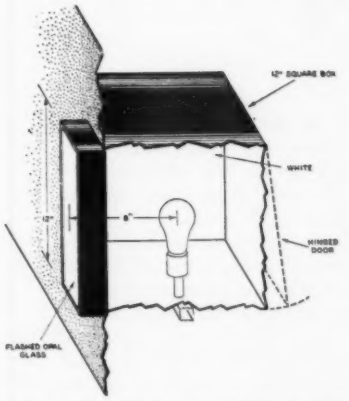
1 A section of the square, beam-like elements of flashed opal glass which tie in the existing sign, form an attractive element with restrained brightness, and cast some light on the upper part of the facade. For many locations 15-watt lamps on 7-in. centers would produce adequate brightness, with a total consumption of about 700 watts.



2 The luminous surface is matte finished in a light tone and is lighted by 40-watt lamps on 12-in. centers, requiring perhaps 1500 watts.



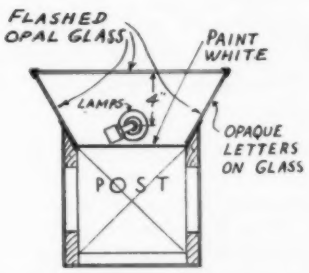
The small silhouette signs below the windows, inside the plate glass, are simple to construct and easy to maintain. Fifteen-watt lamps on 6-in. to 8-in. centers provide adequate illumination to set off the silhouette letters. On 6-in. centers the energy required would be about 750 watts.



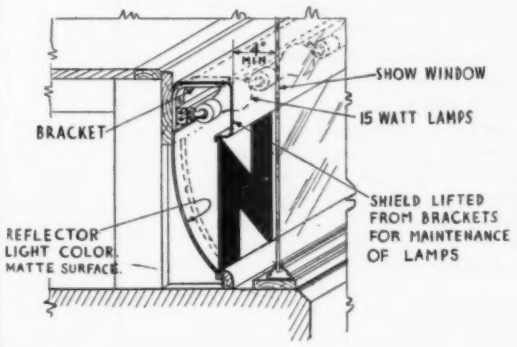
The central glass panel of each complete panel of the transom area may be replaced with a metal sheet carrying a built-out letter (consisting of a shallow trough faced with flashed opal glass) centered in each. Each letter is lighted by a 60-watt A-21 lamp enclosed in a white painted recess, accessible through metal doors from within the store.

A simple means of illuminating the entrance area involves the construction, on the back of the central post, of a system of lamps and a flashed opal glass panel. Such an arrangement, with 15-watt lamps on 8-in. centers will provide an inviting illumination and yet be acceptable to the eyes of those leaving the shop. About 200 watts would be required for this unit.

A conservative revamping. Grouping simple luminous elements effectively adds much in attracting power. About 1200 watts would be required in addition to that used in show windows and projecting sign. The lighting of the show windows needs to be stepped up. It is suggested that the entire front be painted, and that such areas as those below the show windows be covered with sheets of finished metal or other material.



A slightly different post treatment is suggested here involving the flashed opal glass panel to light the entrance, but having in addition small glass panels in the side utilized as signs. This might require 270 watts.



The same store front might be simply treated to produce even greater changes of appearance in the direction of modernity. An indirectly-lighted luminous surface forms both fascia and projecting signs of the modern silhouette type. Estimated energy required, excluding show windows, about 2400 watts.

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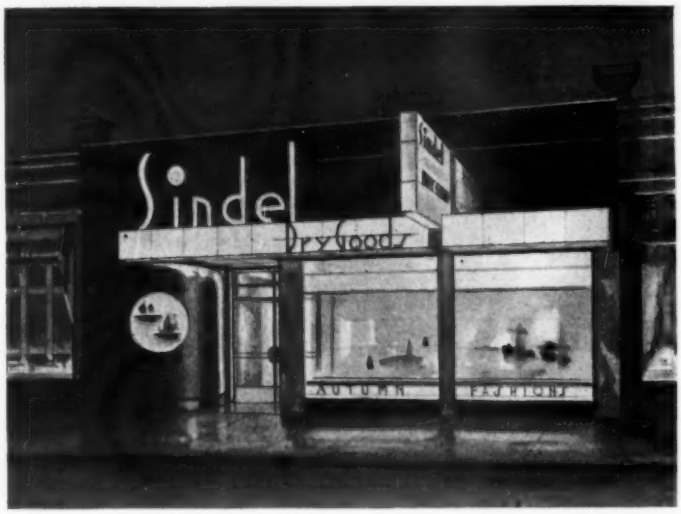
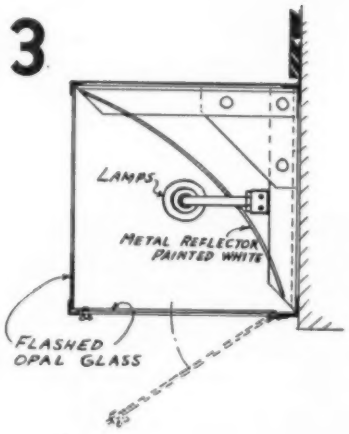
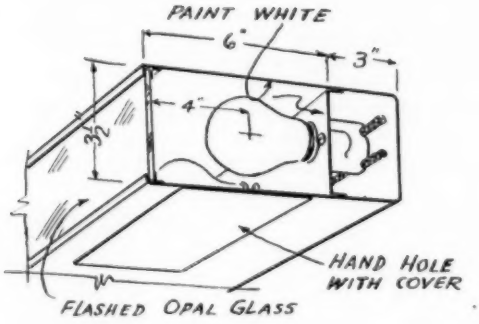


The more ambitious schemes of renovation and illumination can produce effects still more attractive with units which are simple in essentials. This attractive design includes luminous forms which have been found entirely practical and quite effective in composing architectural and advertising schemes in light. The total estimated wattage should be around 3500. This assumes that the location is not too brilliantly lighted, and does not have any unusually effective competitive advertising.

3



The heavy band of light above the show window in this design is very similar to that shown in Suggestion No. 1. Sixty-watt lamps on 12-in. centers would light this square beam (perhaps 15 in. by 15 in. in section) acceptably with an energy consumption of approximately 1300 watts. The illuminated panels of the entrance soffit could be acceptably illuminated with 40-watt lamps 9 in. above the glass on 13-in. centers in all directions, enclosed in a white finished recess.



The large sign letters are suggested in a novel form which has been highly successful both in this country and abroad. The letter stroke, of which a section is suggested here, consists of a trough letter with the mouth of the trough closed with flashed opal glass. A block letter of this type has depth and clean-cut modern appearance, and, when lamps are properly spaced at night, is smooth, softly luminous and pleasing however viewed. Fifteen or twenty-five watt lamps on 6-in. centers along the strokes illuminate the glass faces to suitable brightness. A sign of this size lighted with 15-watt lamps would consume about 750 watts.

The sign projecting over the sidewalk should consist of a metal frame holding panes of flashed opal glass, the glass box so formed being about 9 in. in thickness. Twenty-five-watt lamps should be arranged on $4\frac{1}{2}$-in. centers in a single row behind each line of lettering, centered in the box (the wording on the two sides should be opposite). The wiring channel should be as small as possible and placed above the lamps. Access for replacement of lamps and cleaning should be through hinged panels of glass.

UMI

Rewiring Homes Adequately

By Arthur L. Abbott

ALTHOUGH complete wiring modernization jobs in houses will at first be few and far between, it is well worth while to discuss the application of the Industry Standards of Adequacy in such cases because we should learn how far the Standards can reasonably be applied in this work. Also from a study of complete installations much can be learned about applying the Standards where only a small amount of work is to be done.

To bring out the various problems that will be met in planning the modernization of the wiring in an old house, a house built in northern New Jersey about twenty years ago is taken as an example. Plans of the first, second and third floors are shown on page 12. This is a fairly large nine-room house and before the memorable fall of 1929 the owner's asking price for the property was $19,500.

Survey

In planning the re-wiring the first step must of course be to make a systematic survey of the premises, in order to learn what needs to be done and how it can be done. In this case, overall measurements were first taken so that the floor area could be computed and the dimensions of each principal room were measured and recorded. This part of the work required 15 minutes for two men. (Considerably more time was required to take the additional measurements needed for preparing the complete floor plans; however, this is not a necessary part of the regular survey.) To obtain all other data required the time of one man for 40 minutes. The existing outlets in each room were noted and tests were made to determine which circuit each outlet was connected to. The results of the survey were as follows:

Area. The total floor area is 3,011 sq. ft., including the rear entry and third floor bedroom. The third floor hall and stairway is a finished space, but was not included because it is clearly not of any importance as a load-producing area.

Building Construction. The house is constructed of wood throughout. Floors are hardwood on the first and second floor and single soft pine, 6 in. boards, on the third floor. The entire basement is open and apparently there would be no great difficulty in wiring to outlets in outside walls on the first floor. Wiring could be run down from the attic to outlets in outside walls on the second floor, except at the front and rear where the roof slopes down to meet the attic floor.

Outlets. The present wiring includes:

9	ceiling outlets
20	brackets
13	convenience outlets
6	S. P. switches
4	3-way switches
52	total outlets and switches
42	load outlets

Wiring. The service consists of two No. 8 wires in ¾ in. conduit with a 30-amp. 2-pole switch. There are four branch circuits. Branch circuit wiring is knob and tube work with no outlet boxes.

New Outlets

Considerable thought was given to the layout of additional outlets in order to learn how closely the recommendations in the Adequacy Standards could be followed and the most practical method of determining the number of outlets that should be considered reasonable.

Remembering that each new outlet in this house would probably cost the owner from $3.00 to $4.00, every effort was made to limit the outlets to those that seemed really necessary. A ceiling outlet was shown for each bed room because this is generally accepted practice and the outlets could be installed easily. A ceiling outlet is much needed in the first floor hall. This could be installed without any special difficulty. In the library a ceiling outlet would be difficult to install and is not much needed, and was therefore omitted. In the third floor bed room, also in bed room No. 1 on the second floor, two convenience outlets would serve the purpose very well, though if this were a layout for a new house, three or four such outlets should be provided in each room.

In each principal room except the dining room and kitchen the recommendation of the Standards is practically one convenience outlet per 12 lineal feet of wall space, exclusive of door openings. Various methods of determining the number of convenience outlets were tried out, to find, if possible, some quick method of arriving at this figure from the room dimensions. It was found that in this particular case the total lineal feet of wall in all principal rooms, making no deduction for doors or other openings, was 531. This figure divided by the total number of new and old convenience outlets shown in these rooms (34) gave a figure of 15.6 ft. per outlet.

If home wiring modernization is ever undertaken on a large scale, surveys will have to be made of many thousands of houses and the time required per house will be an important matter. It will probably be best at first to take the time to determine by inspection the new outlets needed in each room. As some experience is acquired, it may be found possible to arrive at the approximate number from the room dimensions and the recorded number of old outlets.

Circuit Arrangement

In this house there is one convenience (?) outlet in the kitchen and there are none in the dining room and laundry. Usually in old houses there will be only a few such outlets in these rooms and these can easily be re-wired with No. 12 wire from the basement, therefore No. 12 should

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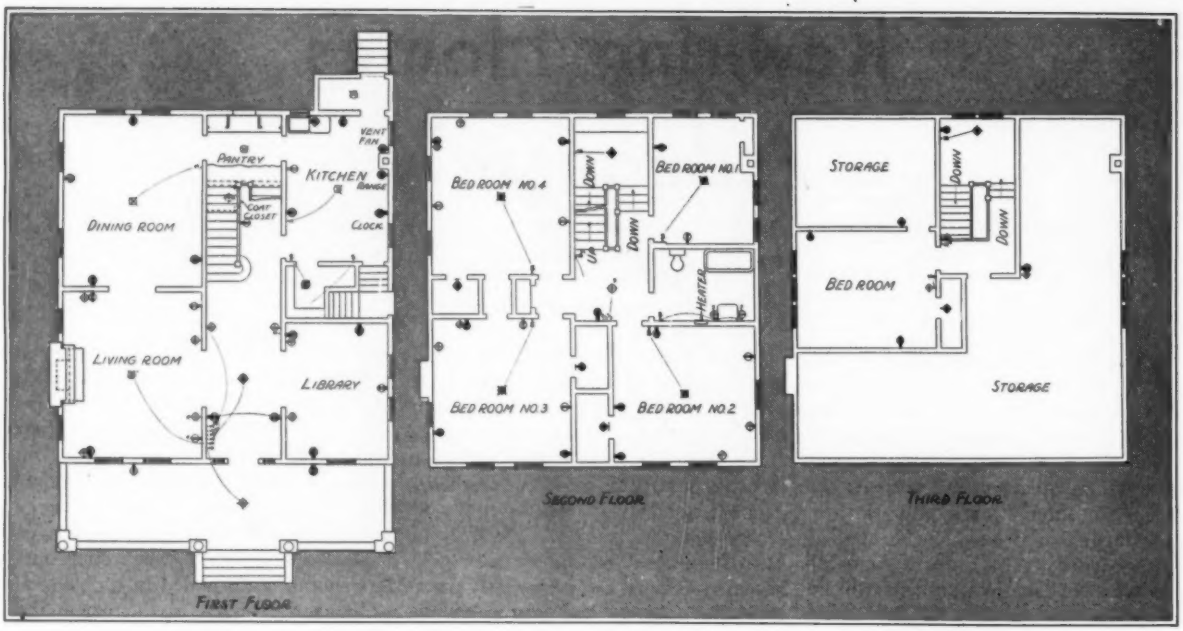

Light face outlets are the old ones. New outlets to bring wiring up to standards in bold face.

always be used for these circuits. Some saving can be made by running one circuit to the laundry outlets and one to all receptacles in the kitchen and dining room and this arrangement will in most cases provide ample capacity.

For the remainder of the wiring, in order to keep the expense down the maximum possible use must be made of the old wiring, which is always No. 14 wire; hence No. 14 may as well be used for the new work. Nothing would be gained by the use of No. 12 for only a part of the work.

The house under discussion has a total floor area of 3,011 sq. ft., which, at 500 sq. ft. per circuit, calls for six circuits in addition to the two special appliance circuits. The total number of load outlets is 91, and 11 of these are supplied by the two special appliance circuits, leaving 80 outlets to be divided among six circuits, therefore four circuits should supply 13 outlets each and two circuits should supply 14 outlets each.

The survey showed that three of the existing circuits were carried up to the second floor, but one of these circuits appears at only one second floor outlet and is evidently extended from the ceiling outlet in the dining room, an arrangement which would be difficult and expensive to change. One of the remaining two circuits feeds three outlets on the first floor. Both of the two new circuits required should therefore be carried up to the attic and used to feed 15 or 16 of the second and third floor outlets. Inspection of the house showed that the two circuits could easily be run up from the basement to the attic. The outlet distribution on the second and third floors will then be about as follows: Old circuit No. 1, one outlet; old circuit No. 2, 14 outlets; old circuit No. 3, 11 outlets; one new circuit, 8 outlets; one new circuit, 9 outlets.

The remaining circuit capacity is to be used for the first floor and basement outlets.

Service

The calculation for the service capacity is as follows:

Lighting and small appliances—		
2,000 sq. ft. at 2 watts per sq. ft.	4,000	watts
1,011 sq. ft. at 1 watt per sq. ft.	1,011	
Allowance	1,000	
Total	6,011	
Large appliances—		
Range	8.500	watts
Water heater	3,000	
Air heater in bath room	2,000	
Spare capacity	1,500	
Total	15,000	
At 70% demand factor	10,500	
Lighting, etc.	6,011	
Total for house	16,511	

At 230 volts this wattage is equivalent to 71.8 amp. A 70-amp. service, or 3 No. 4 service conductors with a 100-amp. switch, will be satisfactory.

Feeder and Panelboard

The present service enters the basement at the front corner under the living room and the new service would have to enter at the same point. From inspection of the premises it is evident that cost will be saved by locating the branch circuit panelboard close to the service switch, so no feeder need be installed except a short connection from the switch to the panelboard. The panelboard must provide for two 50-amp. fuses for the range and plug fuses as follows:

6 general use circuits	6 fuses
2 special appliance circuits	2
1 230-volt circuit for water heater	2
1 230-volt circuit for air heater	2
Spare circuits	2
Total	14

Circuits to Large Appliances

The range circuit will be 50 ft. long and should be three No. 6 wires. The circuit to the water heater will be two No. 12, 16 ft. long, and to the air heater in bath room two No. 12, length 52 ft.

Cost

To the best of the writer's knowledge and belief, no systematic method of estimating the cost of this class of work has ever been developed. The service and circuits to large appliances should be estimated separately and will cost about the same as in a new house, except for some ad-

ditional labor for removing the old service conduit. For the branch circuit work, the only practical method seems to be to determine a cost per outlet based upon experience. The total selling price of the work to be done in this house is very roughly estimated at $430.00. This figure is intended to be high rather than low and it is very probable that at the present time, in many localities, a contract for a corresponding installation could be let for considerably less.

Partial Installations

There are even in these times a very large number of home owners who if properly approached could be sold some additional outlets. A fair number of ranges are being sold and usually each range requires a new service of enlarged capacity. Every such job gives the contractor or the power company representative an entree to the premises and an opportunity to tell the customer something about adequate wiring. The points to be brought out strongly are:

1. The advantages of a wiring system carefully laid out so as to provide sufficient outlets and ample capacity for all needs.
2. The fact that complete electrical equipment is rapidly becoming a necessity if the home is to be considered modern.
3. The desirability of planning all additional wiring so that whatever is done will fit in as a part of a complete adequate installation, and so that this much of the wiring will not need to be changed when the installation is eventually modernized throughout.

Where a home owner is in the market for a few additional outlets, at least a partial survey of the house should be made so as to determine how many circuits would be required for an installation conforming with the Standards. A complete survey would be better if the contractor feels that the conditions justify taking time for this. An approximate estimate should be made of the total number of load outlets needed for a complete job, so that the number of outlets per circuit can be determined.

In most old houses the greatest need for additional circuit capacity is in the "heavy load area," i.e., the kitchen, dining room and laundry. If any new convenience outlets are to be installed in these rooms, the customer should if possible be persuaded to pay for at least one new circuit to supply both the new and the old outlets. This will take some load off one or more of the existing circuits and provide extra capacity for portable appliances in the rooms where they are most used and the additional cost will be very small.

A complete survey will show where additional outlets are needed in every part of the house and will provide the contractor with a definite plan as the objective of his sales talk. Rather than merely endeavoring to sell "some" outlets, it will undoubtedly be found much more effective to explain that the house needs a definite number of new outlets and that to supply these outlets a definite number of circuits is needed, and to suggest that any work done should be planned with a view to the eventual completion of the wiring of the house.

Where a new service must be installed in order to provide for a range, every effort should be made to convince the customer of the advantages of having a service of standard capacity, rather than one which is just barely large enough to supply the range and the existing lighting and portable appliance load. It may be regarded as practically certain that the purchaser of a range will sooner or later wish to add other appliances and he should, therefore, as a measure of ultimate economy, make the small additional investment necessary to provide an adequate service at the outset.

In nearly every case where an existing service is to be replaced because a range is being installed, the smallest size that can be considered for the new service will be three No. 6 conductors and a 60-amp. switch. This is a 50-amp. service. Estimated on the same basis as the cost estimates included in a previous article, the 50-amp. service would cost $23.00, as compared with $27.07 for a 60-amp. service, $36.37 for a 70-amp. service and $41.84 for a 90-amp. service. At a mark up of 33⅓ per cent the additional cost to the home owner would be $5.43 for 60-amp., $17.83 for 70-amp. and $25.12 for 90-amp. In many cases, to install a service of standard capacity will only mean stepping up to the next larger capacity and the difference in cost will be a small item.

With a service of suitable capacity installed and with the service equipment so arranged as to make it easy to install an additional panelboard or cut-out box, circuits for other large appliances, in addition to the range, can be installed at small cost whenever the appliances are purchased and the customer becomes a very good prospect for the sale of the additional appliances.

Public Hearing on NIRA Code Set for September 6

A preview hearing was held by N. R. A. on the electrical contractors' code in Washington on August 24 and after making a number of modifications, the public hearing was set for September 6. The National Electrical Contractors' Association was represented at the preview hearing by President L. E. Mayer of Chicago, J. A. Fowler of Memphis and General Manager L. W. Davis of New York. In addition to the above, President Mayer has named Vice-President E. N. Peak of Marshalltown, Iowa, and D. B. Clayton of Birmingham, Ala., to represent the association at the open hearing.

The present draft of the code was made to conform to instructions of representatives of deputy administrator and legal advisor of NRA. However, the N. E. C. A. advises that this draft is almost certain to be revised at the public hearing on September 6, when legal advisors, industrial advisors, consumer advisors, labor advisors and Department of Commerce experts will all have a final say.

The code is not in force and has no effect until eight days after it has been signed by the President.

The latest modifications in the proposed code include revised labor provisions, elimination of the 6 percent return on investment clause, a revised bidding plan and provisions for clarification of the administrative features.

Minimum Wages

Where no minimum rates have been established regionally or locally

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by mutual agreement between representative groups of employees and employers, the following minimums shall prevail:

(a) For wiremen, fixture installers, maintenance and repair men with three or more years of experience, 60 cents.

(b) Transmission and distribution workers, 40 cents.

(c) Process workers in electrical repair and service shops, 40 cents.

(d) Unskilled workers, 40 cents.

These rates are to apply unless the hourly rate for that class of work on July 15, 1929, was less, in which case the hourly rate shall be not less than that of that date, and in no event less than the following for each group:

(a) 50 cents per hour,
(b) 30 cents per hour,
(c) 32 cents per hour,
(d) 30 cents per hour.

These minimum rates apply with equal force to contractors who work with tools, who shall charge their time so occupied at said rate to each job as though they were employees.

For clerical workers and other employees, the minimum is $15.00 per week in cities of over 500,000 population or their immediate trading area; $14.50 per week in cities between 250,000 and 500,000; $14.00 a week in any city between 2,500 and 250,000; and $12.00 a week in towns under 2,500 population. These provisions do not apply to establishments employing not more than two persons in towns of less than 2,500 population, which towns are not part of a larger trading area.

Maximum Hours

Maximum hours for electrical workers are set at an average of 35 hours per week for any calendar month with the right to work a maximum week of 48 hours for such period, and not more than 8 hours in any one day except for those in executive, administrative and supervisory positions, and except for emergencies and excluding establishments employing not more than two persons in towns of less than 2,500 population, which towns are not part of a larger trading area.

Clerical and office employees, including those on drafting work, shall work not more than 40 hours a week.

Minors under the age of 16 years shall not be employed.

Administration

Under administration there is set up a national code authority for electrical contracting industry of ten members, of which the executive committee of the N. E. C. A. shall appoint from association membership seven members. The remaining three members may be appointed by the administrator from time to time as representative of the industry, but not members of the N. E. C. A.

Any contractor may participate in the activities of the code authority and receive the benefits thereof by accepting the pro-rata share of the cost, either by qualifying as a member of the N. E. C. A. or by paying to the national code authority an amount equal to the N. E. C. A. dues.

Rules of Competition

Under the heading of "Regulation of Fair Competition," the proposed code would require that every contractor shall use an accounting system conforming to the principles of and as detailed and complete as the standard accounting system of the N. E. C. A. and a cost system which will provide as complete and detail knowledge of costs as necessary to carry out provisions of the code.

The cost finding committee which was to be set up in each locality under previous drafts of the code, has been eliminated. The new code merely provides that the N. E. C. A. shall gather cost data on labor and administrative expense and make such data generally available to the electrical contracting industry and to N. R. A.

Bidding

For the purposes of reviewing bids the local administrative committee, as may be appointed by the national code authority, has power to investigate any reported violation of the code and to call upon any contractor within that territory for such data as may be necessary to carry out provisions of the code. Thus each local committee shall designate a depository for bids which shall be a bank or trust company approved by the national code authority. Contractors bidding on a job amounting to $250.00 or more shall file sealed copies of their bids and any revisions thereof with the depository, to remain there sealed until after bids have been opened. Bidding contractors shall indicate in their proposals that a copy of the same has been so deposited. Upon awarding of the contract or opening of bids, the local committee shall take from the depository all of the copies of bids for that work, and after tabulating them, send copies of the tabulations, together with detail of contract award, to each bidder who shall pay to the local committee his share of the cost of handling and tabulating the information, but not over $1.00 per bidder. Any bidder may request the local committee to appoint a committee of review of not more than three non-bidders on the job, who shall be employed to call upon all the bidders for any data being necessary to determine whether the code had been violated. If the code has been found to be violated, the committee of review shall report its findings to the local committee for such action as the latter may deem proper in accordance with N. I. R. A.

All expenses incurred by the local committee are to be borne by the regional and local associations designated by the national code authority as having jurisdiction.

Service Shops

If it has been the generally recognized practice in any branch or sub-division of the electrical contracting industry, such as motor repair shops, to issue printed net price-lists or price-lists with discount sheets and fixed terms of payment, each contractor engaged in such business shall, within ten days, file a net price-list or price-list and discount sheet with the local committee, showing his current prices in terms of payment. Copies of the same shall be sent by the local committee to all known contractors engaged in such business in that trading area. Revisions may be made providing those changes are filed ten days in advance of effective date with the local committee. Copies of such revisions shall be sent by the local committee to competitors in that area. No contractor shall offer any lower prices or greater discounts or more favorable terms than those provided in his current net price-lists or price-lists and discount sheets.

The other provisions of the code remain essentially as in previous drafts except perhaps as to minor changes in the wording and in arrangement.

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Wiring Layout Requirements for Federal Buildings

By G. Kendrick Bringhurst
Consulting Engineer

DURING the last year of the past administration, a great wave of Federal building construction swept over the country, and from present indications it will continue during the new administration. Government buildings, ranging in cost from thousands to millions of dollars, including more than 1200 projects, have been authorized in the $700,000,000 program. In many instances the commission for design has been awarded to private architects, and these in turn have engaged the services of other experts to lay out the heating, plumbing, ventilating and electrical installations.

Due to their long experience in the operation and maintenance of government buildings, the Treasury Department has certain requirements which to a large extent govern the design and installation of equipment. In order that their layouts may be approved in the shortest possible time, and with the smallest amount of expense to themselves, private engineers and contractors should make themselves thoroughly familiar with these requirements.

Otherwise, it may be found to be a long drawn out and not especially profitable process, entailing many trips to Washington and a large amount of correspondence, with changes in plans and specifications, before the layouts receive the stamp of final approval.

The following information, relating to conduit and wiring is compiled from the instructions issued by the Treasury Department and from personal experience with the wishes of the federal engineers, and should prove of value to those engaged to design this type of work.

General:—Lighting and power service to be installed for all types of buildings should include a complete conduit system for lighting, including outlets for electric fans, clocks, hand-dryers and extensions.

Current to be standard voltage 110-220, three-wire, single-phase, generally. Where three-phase, four-wire systems are available, the main service feeder and branch feeders up to the distribution panels should be designed for same. The distribution panels for lighting to be balanced across this service.

Where the utilities do not offer combined power and lighting rates and require separate meters, a separate 3-phase power service and a separate single-phase lighting service shall be run into the building.

Small motors up to 5 H. P. are to be connected on single-phase lighting service, either 110 or 220 volts, as required by the equipment, for buildings which do not have 3-phase power for larger motors.

Service:—All service conduits are to be underground, usually terminating on a wood pole set at rear of lot on Government property, accessible from street lines and out of way of future extensions.

Where there are two public service companies with facilities to furnish electric service, an underground connection shall be run from each company for both light and power (if required) to a central location, so that the Government may choose the better rate.

Layouts:—The plans should indicate the runs of conduit to all outlets, whether concealed in floor or exposed, etc. The runs should indicate the actual conduit system and not depend on symbols for switch loops or circuit numbers by the side of each outlet.

Lighting:—The illumination, exclusive of furniture lighting, shall be figured on the following basis and the wattage to be used shall be indicated on the plans:

Lobbies, corridors, basement storage rooms, toilets and similar rooms, mailing platforms and vestibules, boiler rooms (for the larger buildings), vaults, 1 watt per sq. ft.

All post office working spaces, all office rooms, swing rooms, 2 watts per sq. ft.

Court rooms, 3 watts per sq. ft.

Lighting ceiling outlets in all post office working spaces, swing rooms and offices shall be spaced about 10 ft. on centers.

Each screen window shall have a bracket outlet; lock box and similar screen sections to have bracket outlets spaced about 3 ft. apart (25 watts).

Workroom furniture lighting to be supplied from duplex receptacles, located 8 ft. above the floor on columns and side walls at suitable locations in workroom. In addition, where ceiling height is 16 ft. or less, provide one 4-light wireless cluster for each 300 sq. ft. of floor area.

For ceiling heights exceeding 16 ft., omit the wireless clusters, and provide the equivalent of same in reserve junction boxes on basement ceiling. Outlets should be provided for ceiling fans, one for each 500 sq. ft. of floor area where wireless clusters are not provided.

The use of cove lighting in lobbies of the smaller post office buildings is not recommended, hung fixtures of original, ornamental design being preferred.

The number of workroom ceiling outlets per circuit, generally, shall not exceed six, and the load per circuit should be limited to about 1000 watts.

Basement storage rooms, swing rooms and all toilet rooms shall be provided with regular lighting outlets with wall switches. Two or more outlets may be controlled with one wall switch where all such outlets would be needed if any light at all is required.

Two branch circuits may be run home in one conduit for circuits connected on single-phase panel boards, using a common wire for neutral, provided the outsides are connected to opposite busses.

Three branch circuits may be run home in one conduit for circuits connected on three-phase, four-wire panel boards, using a common wire for neutral, provided each outside is connected to a phase buss.

Vaults generally should have ceiling outlets with switch on outside wall. Vaults with ceilings 7 ft. 6 in. and less are to have lamp receptacles with wall switch.

In boiler rooms for the smaller buildings, provide drop cord outlets spaced about 15 ft. apart. In the larger buildings, the boiler rooms provide regular ceiling outlets for fixtures, with switch near entrance doors.

Receptacles:—Each office room is to have one or more duplex receptacles set above baseboard. Receptacles and floor boxes are to be on separate circuits from lighting fixture outlets. Not over 12 outlets are to be provided on receptacle circuits.

Provide plug receptacles (duplex) in post office lookouts, about 50 ft. apart for portable vacuum cleaners and extension cord. Receptacles to connect to nearest local circuit.

Provide a flush baseboard receptacle (15 amp. 115 volt) for all toilet rooms.

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Receptacles are to be set near lavatories, and in large toilet rooms with more than two lavatories, two outlets are to be provided, for future sanitary hand-dryers. Each dryer outlet to be on a separate circuit, approximately 1650 watts each.

Provide flush baseboard receptacle, 400 watts, in corridors and lobbies, about 75 ft. apart, for portable vacuum cleaners.

Each electrically operated drinking fountain to have a standard single plug receptacle, 200 watts, located 18 in. above floor.

Power:—All necessary conduit and wiring between the power feeder panel and the motor disconnect switch shall be included. Provide an unfused disconnect switch at each motor location when the motor cannot be seen from the feeder panel. Fused switches shall be furnished for branches which are smaller than their feeders.

Exterior Lighting:—Each outside lamp standard to be connected with conduit from a junction box just inside of basement wall, and No. 12 L. C. wire provided. Conduit inside of building to assemble these junction boxes on one circuit for each entrance and controlled from single pole lock wall switch when located in lobby.

Exterior lamp brackets at entrances to be connected and controlled as for the lamp standards.

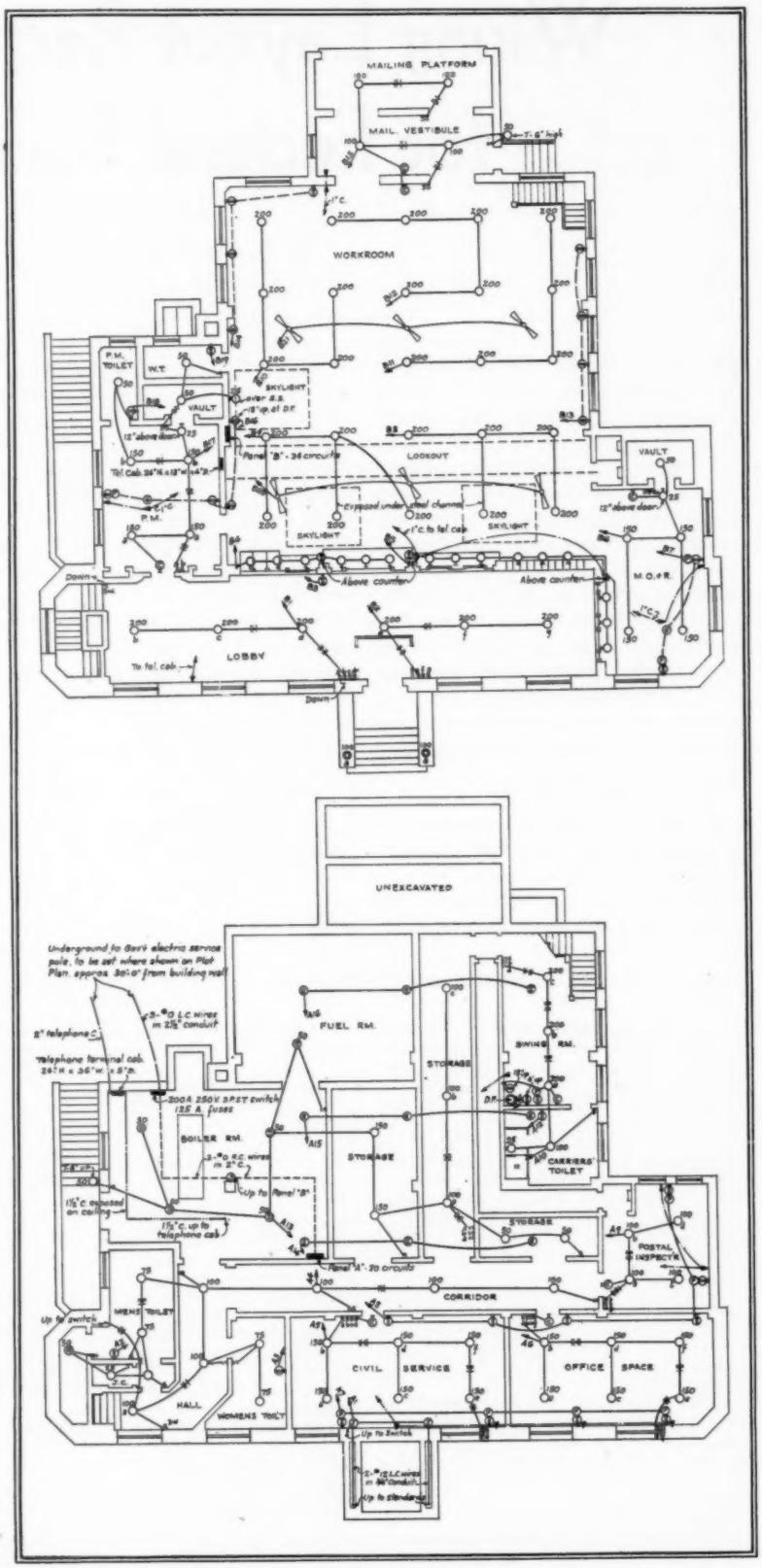
No exterior flood lighting will be approved. Provide standards or brackets at all entrances.

Switches:—In general, use wall switches in all offices, lobbies, corridors, mailing vestibules, swing rooms and toilets. Switches should be provided for each outlet, or not more than two outlets on a switch. Lobby switches, when located in public space, to be lock type. No wall switches are to be provided in post office workroom, or in money order and registry room.

In rear of building, for mailing platforms and vestibules, standard outlet boxes for ceiling fixtures are to be furnished. These to be switched from inside of building and arranged generally to have alternate outlets on a switch, and two outlets per switch for large spaces. Where marquise with low ceiling occurs, use lamp receptacles, and show conduits run exposed, at right angles or parallel to joists where open construction occurs.

Clocks:—Electric clock outlets to be provided for all offices, over entrance door or other location where the clock can be readily seen, with outlet about 7 ft. 6 in. above floor. Same outlets to be provided in swing rooms, workroom, mailing vestibule and wherever else deemed necessary. No clocks to be in public lobbies or on exterior of building. Buildings having less than 25 clocks should be arranged for synchronous motor type by extending unswitched lighting current from the nearest outlet. Outlets to be provided with single plug receptacles and wall plates.

Signal Systems:—In postal buildings costing $500,000 to $1,000,000, a fire alarm system should be installed, general alarm, closed circuit. In buildings costing more than $1,000,000, add the presignal feature with switch to transfer from presignal to general alarm, and vice versa, also recording equipment. In buildings costing $2,000,000 and over, add the time stamp, and also night watchman's signal stations equipped with signal lamp and



Basement (lower) and first floor plan of typical wiring layout for post offices costing less than $100,000.

telephone connection to a central location.

Postal buildings in cities with 50,000 or more in population, to have a conduit system for future vault protection system.

Special conduit signal systems must be installed for call bells, etc., from the judge's and clerk's desk in each court room to all offices in connection with the court suite. All Weather Bureau offices require special signal conduit systems. In some cases, signal service may be installed in postmaster's suite.

Such equipment as Telautographs, teletype machines, hold-up burglar foot rails, etc., are not to be furnished.

Telephone:—Telephone conduit system should be brought in the building, underground and terminated flush with interior wall, in janitor's or boiler room. Carry a main conduit run to main terminal cabinet, centrally located. Wall outlets are located just above the baseboard, except pay stations for the customary wall type which should have outlets about 4 ft. 8 in. up. Pay station outlets are to be provided in public lobbies, and in corridors adjacent to court rooms, internal revenue and similar offices.

Closets or spaces with door for pay stations are not approved for public buildings. Use standard open type stalls, assembled in a group.

A wall outlet and floor box for telephone should be provided in each titled official's office, where no underfloor duct system occurs. Regular offices to have wall outlet only. Two outlets on each home run.

Telephone conduit layouts should be approved by local telephone companies. as regards sizes of junction cabinets and house cable runs. Service connections should not be less than 2 in. steel, fibre or terra cotta as required. Conduits should be run at least 10 ft. up company's pole, or to a manhole if requested. If required, electric service and telephone service conduits may be run to a wooden pole in rear of building. Poles to be furnished by the Government and located convenient to each company's pole lines.

In cities of 400,000 population and over, a special telephone and signal system shall be provided in the lookout system.

Buildings costing $1,000,000 and more, shall be equipped with two lines of double underfloor ducts passing through each office.

In buildings where a competent electrician will be employed, renewable type cartridge fuses may be used for feeder panels and service switches.

Lamps:—The following sizes of lamps are standard in inside frosted lamps: 25, 40, 50, 60, 75, 100, 150, 200, and 300 watts, and the sizes indicated on the plans must be one of these. Make an effort to use the minimum number of different lamp sizes for any particular job, i.e., don't use 40, 50 and 60 all on the same job, but select one size to care for such locations.

Feeders:—The sizes of all feeders for light and power should be in accordance with the methods outlined in the latest edition of the National Electrical Code.

Flag Poles:—Make provision to ground all steel flag poles.

Lighting Fixtures:—If the contract embraces the designing of special interior lighting fixtures for public lobbies, main entrance vestibules, public stair halls and court rooms, include drawings in detail, of original design. All other lighting fixtures to be furnished by the Government, unless otherwise provided. Special fixtures shall be designed to take the least possible number of standard type lamps. Tubular lamps and other special shapes are not considered as standard. Consideration is given to efficiency and maintenance as well as architectural design.

Fixtures for court rooms shall be of totally indirect type, using silver mirrored glass reflectors of standard sizes upon which competition may be obtained. Special fixtures for other locations shall be of direct type lighting incorporating the use of some type diffusing glassware to eliminate glare. The use of bare lamp type of fixture is not desired.

All fixture designs shall be fully detailed as to shape, size, materials, finish, castings, gauge, etc. Special patented features shall not be incorporated.

All lamps will be furnished by the Government.

Conclusion:—In conclusion, it is advisable to make the layouts in pencil until they have been given the "40 per cent" check over by the Treasury Department engineers.

The accompanying plans show the typical conduit and wiring layout for post office buildings costing less than $100,000.

The Little Contractor

By Charles L. Eidlitz
Director, N. Y. Electrical Contractors' Association

The electrical contractor of 1933 must realize that times have changed. Five years ago any man who knew the business and had enough money to pay a month's rent on a small office and could convince the telephone company that he would be able to pay their rental, could if he wished, go into the electrical contracting business. All he had to do was to secure a good sized contract from some well known owner or general contractor, i.e., one whose financial standing was such that it was a recognized fact that he would pay his bill. Armed with this contract he could approach the bank and without much difficulty was able to borrow on his future profits and prospects. The manufacturer and jobber were usually willing to stay with him for reasonable amounts and altogether it was rather easy to get a start.

Personally I have always been a believer that every man was entitled to this chance and that the little fellow had a right to be ambitious to get into the larger class, and so I regret that this is not possible at the present time. What contractors must now face is a condition and not a theory.

Banks today look with disfavor upon all construction activities. They all have cold feet anyway, but they are particularly frapped so far as the contracting business is concerned. The executive of one of our very largest banks made the statement to me recently, "We consider everyone in the building trade a liability and feel that making them any loan whatever, is bound to result in our being left holding the bag."

I find that this thought is pretty general with bankers and so contractors should appreciate that it is folly for them to take on a job of a size which they, themselves are unable to finance. Jobbers and manufacturers have been pretty hard hit from a credit standpoint and they have, I believe, rather similar views to those held by the banks. All of this being the case, and I know it to be so, it is foolish for a contractor to even waste his time figuring a job unless he feels that should he be successful he can, with his own resources, carry the operation through and pay his way as he goes.

Some day when things generally loosen up and banks again are willing to go back to the legitimate loaning for business activity the contractor starting for himself or the small contractor already in business will be able to grow by borrowing for his unusual needs.

In the meantime, much as I dislike to say it, the little fellow has no alternative but to be content to mark time, pass up the larger operations and confine himself to small work in the hope that he can stay out of red ink until expansion is again made possible.

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electrical contracting

With which is consolidated Electrical Record

S. B. WILLIAMS, Editor

CODE COORDINATION

THE Florida Association of Electrical Contractors and Dealers is to be congratulated on its initiative in bringing together representatives of the other branches of the electrical industry in Florida for the purpose of selecting a committee representative of all branches to coordinate the several national NIRA codes upon their approval.

The work of this committee should cement the electrical industry in Florida closer together than ever before. It is not unreasonable to suppose that this committee might recognize its greater opportunity for service to the industry by suggesting a way wherein all could unite in a state-wide effort to improve the electrical market in Florida.

COOPERATIVE PURCHASING

EVERY now and then a plan for cooperative purchasing is proposed for electrical contractors and dealers. The promoters of the plan set forth the price advantages to be gained by group buying but say nothing about the disadvantages.

If we assume that group buying for cash will bring the wholesaler's price to the syndicate we have the maximum advantage. On the other side of the fence are the following items to be considered: All orders must be accompanied by cash; since only group orders will receive maximum discounts, pick-up orders cannot be placed and inventories will have to be increased; only the line that gives the discount can be secured and this may not be the line on which you have been working for years; wholesalers' salesmen will no longer call on you bringing new items and new ideas; difficulty of returning merchandise; no responsibility of manufacturer after delivery to central point; cost of distributing service.

When everything is checked up it will be apparent that there is no easy substitute for the regular channels of distribution of merchandise. Any attempt to by-pass the regular sources of supply in order to get an additional discount will bring with it a chain of problems which can easily more than offset any apparent advantage.

Contractors and dealers would be well advised to be ultra cautious in joining up with any such plan.

ADEQUATE WIRING IN K. C.

THE Electric and Radio Association of Kansas City, Mo., reports that most builders are holding up the adequacy of their wiring installation. It is now almost standard practice in that city to provide outlets for telephone, electric refrigerator, outside porch and protective light at the rear of the home.

This has come about as the result of a continuous effort of the league on Red Seal wiring. There are not many homes going up today in Kansas City, but it is obvious that anything that is sold to a builder today is essential and will be included in the new homes yet to be built.

The country is in for another wave of residential building. Must we wait until it is upon us before we start selling adequacy? The results that Kansas City and other places have had that have pushed Red Seal wiring, can be had by any city that will sell adequate wiring.

A LOAD BUILDING RATE

A MOST progressive step in public utility rate making has just been announced by the Union Electric Light and Power Company of St. Louis, Mo. Louis H. Egan, president of the company, is reported to have said that the new rates, which will be put into effect in November, will give to St. Louis electric service at the lowest rates in the United States.

The new residential rates start at 5 cents for the first 32 kw-hr., the next 168 kw-hr. at 2.5 cents and all over 200 kw-hr. at 1.5 cents, with a 5 percent discount for prompt payment.

Rate schedules such as this should prove very successful in developing new residential load. They make electricity the cheap-

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est fuel for cooking and water heating, and should help materially to develop a residential heating load during the fall and spring months.

Electrical contractors will be particularly interested in the results from these rates, for if they are successful they should be the forerunner of many similar schedules in other parts of the country, the inevitable result of which will be a larger market for wiring.

COST FINDING AGENCIES

IN all N. R. A. Codes the employers are trying to secure but one thing and that is the elimination of price-cutting competition. To accomplish this it is necessary first to set up some standard. The electrical manufacturers' code requires the individual manufacturer to set up his own standard and adhere to it. That is known as the open price plan.

Electrical contractors, however, cannot make a price schedule which can be adhered to because of differences of construction, of labor efficiency, etc. Every job is special.

In anticipation of the National code, the New York Electrical Contractors Association has set up such a cost finding bureau to check estimates in excess of $250 before the bids are filed. This bureau shall also receive sealed copies of all bids filed and shall open them after the job is let in case there is a dispute. In this way the New York association expects to be able to prevent honest mistakes as well as cheating.

This bureau is not a quantity survey bureau but a checking bureau. The distinction is obvious. A survey bureau will furnish the same estimate to all subscribers while a checking bureau furnishes no estimates. By means of a checking bureau no suspicion of collusion can exist. Competing contractors can be assured that no one will present figures on a job except those competent to estimate the work and that then the figures will not be below cost.

What a difference this is going to make in the sales psychology of the electrical contractor. If price can no longer be sold, what is the contractor to sell?

In other words, the New Deal is going to force contractors to sell where before they bought their jobs. The new competition, now that below cost price-cutting is eliminated, must be on the basis of quality and performance.

Who are the men working for you? What is their ability? How long have they been with you? Since the contracting business is largely a service the personnel will need studying to better find out their qualifications.

With price competition in the background it is going to be possible to sell adequate wiring. The price-cutters in the past had to rely to a considerable extent on cutting down on the job. This will no longer be permitted.

Washington will be particularly interested in any job reduction because that will mean less labor, and, of course, the whole purpose of N. I. R. A. is to increase employment.

While the early drafts of the proposed code contained provisions for a cost finding agency, the section was deleted after the preview hearing, probably as savoring too much of price fixing. Nevertheless, if below cost competition is to be stopped and fair competition maintained some such cost finding agency would appear to be imperative.

THE 1933 CONVENTION

IT has been customary each year for the last thirty-two to hold an annual convention of the National Electrical Contractors Association. To go to these conventions, however, has meant the expenditure of money by the visitors and a lot of expense to the contractors and the electrical industry in the host city.

This year the executive committee, N. E. C. A., did not feel justified in placing this expense upon anybody and so the convention, which had been planned for Indianapolis in October, was called off.

The executive committee felt, however, that it would be unwise to let more than a year pass without reports to the membership from the regular committees. For that reason the N. E. C. A. has requested its official publication, ELECTRICAL CONTRACTING, to hold the 1933 N. E. C. A. convention on paper in its October issue. This will be done.

The program committee of the association, together with General Manager Davis, have arranged for the reports and convention papers to be presented to the membership and the industry at large in our next issue.

This will probably be the largest attended convention ever held in the electrical contracting industry. Don't miss it!

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\\\ code chats ///

A MONTHLY DISCUSSION OF WIRING PRACTICE AND QUESTIONS OF INTERPRETATION, PRESENTED WITH A VIEW TOWARD ENCOURAGING A BETTER UNDERSTANDING OF THE NATIONAL ELECTRICAL CODE

CONDUCTED BY F. N. M. SQUIRES
ASSISTANT CHIEF INSPECTOR, N. Y. BOARD OF FIRE UNDERWRITERS

SERVICE STATION OFFICES NOT HAZARDOUS LOCATIONS

Are gasoline service stations without garages, where motor oils are stored in the sales room, considered as hazardous locations?

The office of a service station in which no gasoline is kept, except in original sealed containers, is not generally classified as a hazardous location.

USE OF IRON PIPE AS SERVICE CONDUIT

Can iron pipe be used, instead of rigid conduit, for underground services running from pole line to entrance in building?

The National Electrical Code deals with, and recognizes only, approved electrical conduit and therefore, under the Code, inspectors are supposed to approve only regular electrical conduit. However, many inspection authorities in dealing with service work, temper their requirements to local conditions.

As the Code requires that underground service wires be lead covered, and as the lead covering affords protection against abrasion from pulling the wires into the conduit, some inspection departments have allowed the use of ordinary iron pipe in place of approved electrical conduit for this purpose. Also some inspection departments feel that it is not a very great concern of theirs whether pipe or conduit is used on the underground service run since this is generally outside of the building, and the whole line can generally burn out without setting fire to a building.

There is little doubt, however, but that conduit should be used in all cases, but where any deviation is made from the Code requirement, the local inspection bureau should be consulted and their permission obtained before starting the work.

FEEDER CAPACITY

Does paragraph b on page 83 of the Code, allow a contractor to install a smaller feeder conductor when total connected load is known, instead of a larger size conductor which would be reached if calculated in accordance with the formula given in Article 6, section 613-d, paragraph 5?

This question is quite fully answered in the first fine print note under the caption of 613-b. Scope and Application. It is as follows:

> It is the intent of this Code that provisions of this section shall apply only when it is desired to install feeder conductors of capacities smaller than are called for on the basis of the current required to supply the total connected load.

UNDERGROUND SERVICE ENTRANCE WORK

Kindly advise as to the procedure in running a 3-wire service from a secondary on a pole outside the building, underground to the meter switch in the building, the kind of cable commonly used fittings, etc.

Until recently it has been customary to run lead covered wires in conduit when supplying current through an underground conduit from an overhead supply line. The Code required that the portion underground and that on the pole for a distance of 8 ft. above ground, be lead covered wires in conduit. Now, however, the Code wording has been changed to allow the use of the new types of service entrance cables, a list of which may be found in the List of Approved Fittings published by Underwriters' Laboratories. This cable has a steel armor which affords the mechanical protection required on the pole and also affords sufficient protection underground so that the cable may be laid directly in the earth without conduit.

GROUNDING STEEL STRUCTURES

Please advise us if there is a separate code covering the grounding of steel structures, such as gasoline and oil tanks, steel supports for travelling cranes, pipes carrying gasoline, etc., for protection against lightning, static electricity and stray currents. It seems to us that Article 9 of the National Electric Code does not fully cover this subject.

This question was referred to Dr. Lloyd, Chief of Section Safety Standards of the Bureau of Standards at Washington, D. C. who has made a careful study of such matters and who reports as follows:

"The question of grounding for protection against lightning is covered in the Code for Protection Against Lightning, Handbook No. 17, of this Bureau, which can be obtained from the Superintendent of Documents, Government Printing Office, Washington, D. C., for 15 cents per copy.

"In many cases oil tanks are automatically grounding by the connected pipes running underground.

"Upon referring to a publication of the American Petroleum Institute, entitled 'Fire Protection in Re-

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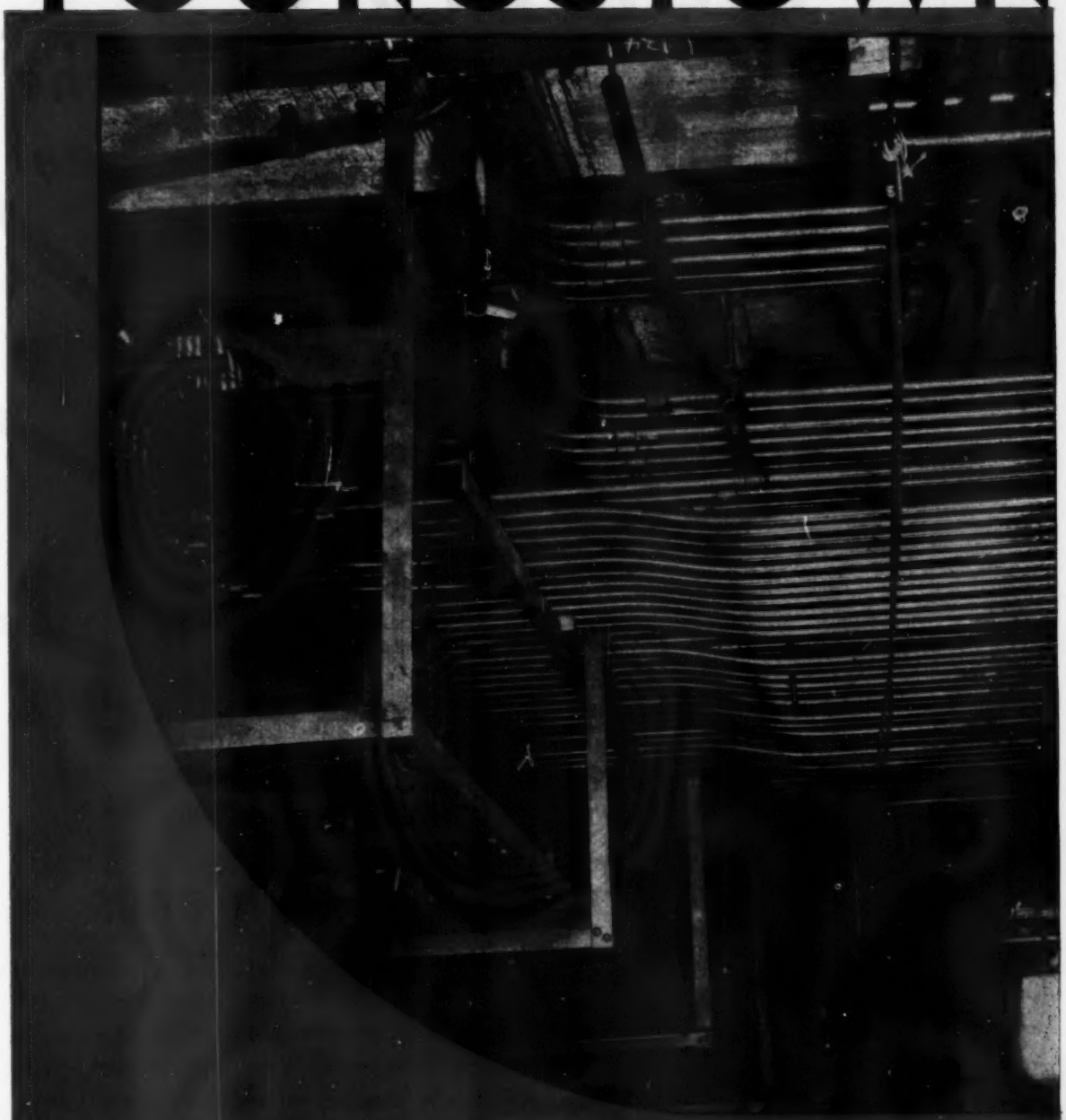
YOUNGSTOWN



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This full weight, rigid steel conduit combines all features that are essential both to permanence and ease of installation.

N. I. R. A.

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will be the Paramount Sales Arguments

Price will no longer be a sales argument—quality, prestige and service have come to the fore. Every electrical contractor will want to sell and recommend only articles which have these three requisites. They cannot afford to do otherwise.

Electrical contractors have been told month after month that the Sangamo Time-switch is not a price item—it is a product on which they can stake their reputation as a first-class product. That is why the Sangamo is the time-switch to sell NOW, and at all times.

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SANGAMO . . has made only *Quality* products

Sangamo has been making precision instruments for over 30 years—Sangamo knows how to make only quality instruments.

SANGAMO *Prestige* has been over 30 years in the making

Sangamo prestige has been in the making for over 30 years—well-known for fair dealing and backing up its guarantee—has built a prestige that will help you sell the quality Sangamo Time-switch.

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Sangamo Time-switches have proven their worth in actual service. Thousands of users can testify that a Sangamo installation is a trouble free installation. This means no comebacks for profit taking extra service.

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Fall Lighting Opportunities for the Contractor!

Features of Type J Wire Enclosing Bracket:
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Universal joint
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Cast virgin aluminum bracket

The Fall floodlighting season is opening — Outdoor lighting is your present opportunity for profitable sales — Go after all sports lighting, beer gardens, protective lighting, etc.

The Quad line of Reflectors will fill any lighting requirements you may have.

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Send for catalog if you do not have one.

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fineries,' I find no reference to methods of grounding, but in speaking of railroad trackage the following sentence occurs:

> 'Electrical bonding between rails and piping systems, where necessary, should be in accordance with recommendations contained in A. R. A. Circular No. ES-3.'

This is a publication of the American Railway Association, which has an office in New York City."

PRACTICAL ANSWERS TO 117 QUESTIONS BASED ON 1930 CODE

I have received and read through the booklet "Practical Answers to 117 Puzzling Code Questions" but would like to have a few of the answers ironed out.

For instance, on Page 23, Re: 508-i, you say that electric metallic tubing may be used only for exposed work while I read 508-i to say that it may also be used in concrete or masonry walls if provided with water-tight fittings.

Our correspondent has evidently failed to notice that on both the title page of the booklet and in the "Foreword" attention is called to the fact that the answers and discussion throughout the booklet were based upon the 1930 Code.

In the case of the rule referred to above there was quite a change with the rule in the 1931 Code over that of the 1930 Code.

Filling stations are in most cases requiring lead covered wire in conduit. Does the 1931 Code state that it shall be used?

The Chat quoted on page 35 of the "117 Answers" discloses that the question asked was relative to rule 501 which deals with "Open Wires" and not conduit work. Our answer was to the effect that none of the provisions of 501 should be applied to conduit work. However, it might be mentioned here that while the 1930 Code (on which that former Chat was based) did not require the use of lead covered wires in underground conduit, the 1931 Code now requires lead covered wires.

Page 43 — Re: Accessible Roof Spaces. Isn't this questionable?

No. This is not questionable. This is an interpretation of an Interpretations Committee of the Electrical Committee and interprets the intent of the Code rule. This item was not merely the opinion of the editor of Code Chats.

IT WILL PAY YOU TO READ THIS TWICE

This drive for better light means better business for you . . .

THIS fall a new opportunity for sales of lighting and lighting material opens to the Electrical Contractor. For this fall all branches of the lighting industry are working together in a concerted drive to sell better light for better sight. And you can cash in on it.

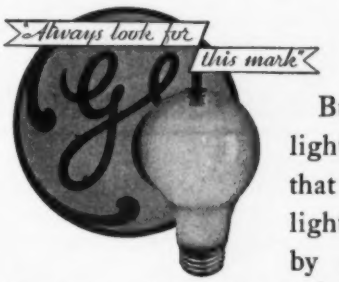
Everywhere people have been letting things slide when it came to lighting. *In homes* there are millions of empty sockets that should and can be filled. There are countless opportunities for new fixtures, especially in the kitchen and in the bathroom. Families that have doubled up will now be going single . . . . new markets for lighting.

Factories have been dormant. Obsolescence exists everywhere. Absolute necessity for new, improved lighting faces most manufacturers. Many mills and factories which have been working on day shifts, under the new deal will operate *two* shifts. The need for good, up-to-date lighting equipment to get quality production is obvious. Here is another chance to sell in a big market.

Stores operating under the new deal will not want to miss the many advantages that good lighting will bring them. *Offices,* too, will feel the pressure of renting competition driving them toward better light . . . still more markets.

Go after these markets. Join your efforts with those of the entire lighting industry. Sell better light for better sight. It will mean more sales of wire, conduit, and outlets, as well as sales of fixtures and lamps.

* * * * *



But when you sell lighting, make sure that it will *give* better light. Sell lamps made by a reliable manufacturer. Sell G-E MAZDA lamps. Thus you guard your customers from the use of lamps characterized by early burnouts, premature blackening, and wasted current-for-light.

Not only are G-E MAZDA lamps precision built . . . and checked by 480 distinct processes, tests and inspections . . . but General Electric is doing its greatest advertising job this fall to make them easier for you to sell. General Electric Company, Nela Park, Cleveland, Ohio.

General Electric invites you to visit its exhibit in the Electrical Building at the Century of Progress

GENERAL ELECTRIC

MAZDA LAMPS

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N.E.C.A.
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Contractors Organized for Industry Welfare

NEW N. E. C. A. CHAPTERS

Following is a list of new Chapters that have received charters up to the time of going to press:

The Electrical Contractors Association of Cleveland covering the jurisdiction over Cuyahoga County, Ohio, to be known as the Cleveland Chapter. G. P. Fuerst, 719 Caxton Building, Cleveland, Business Manager.

The Electrical Contractors Association of Dayton, Ohio, Inc., covering the jurisdiction over Montgomery, Preble, Greene, Darke, Miami and Shelby Counties, to be known as the Dayton Chapter. Frank P. Elardo, 11 West First Street, Dayton, Secretary.

The Institute of Electrical Contractors of Richmond, Va., Inc., covering the jurisdiction of the City of Richmond and surrounding territory within a radious of fifty miles, to be known as the Richmond, Virginia Chapter. T. W. Wilmer, Broad-Grace Arcade Building, Richmond, President. Alex L. Bear, Broad-Grace Building, Richmond, Secretary.

Madison (Wis.) Electrical Contractor-Dealers Association, covering the jurisdiction over the city of Madison, to be known as the Madison Chapter. L. W. Burch, of 202 E. Washington Avenue, Madison, President. Wm. C. Schlosser, 323 E. Wilson Street, Madison, Secretary.

Institute of Electrical Contractors of the District of Columbia, Inc., covering the jurisdiction over District of Columbia and Montgomery and Prince George Counties, of Md and Fairfax County, Va., to be known as the Washington, D. C Chapter. L. T. Souder, 839 Florida Avenue, N. E., Washington, D. C., President.

Electrical Contractors Association of Pittsburgh, covering the jurisdiction over Armstrong, Beaver, Butler, Fayette, Washington and Westmoreland Counties, Pa., to be known as the Pittsburgh, Pa. Chapter. Benjamin Raphael, Law and Finance Building, Pittsburgh, Vice President. Harry Carter, 1433 Oliver Building, Pittsburgh, Treasurer.

A number of additional chapters are now being formed.

FRANK M. O'MEARA

Frank M. O'Meara, former field representative for the National Electrical Contractors Association, died on July 2 at the age of 49 on account of heart trouble.

Mr. O'Meara, prior to joining the staff of the association on December 1, 1929, had eight years of electrical experience with the Pennsylvania Railroad and the Chicago and Great Western. Later he was with Swift & Company and then with the Palmolive Company for nine years doing association work. While with the Palmolive Company Mr. O'Meara was instrumental in organizing the margerine group of the company.

NEW MEMBERS

The following applicants have been accepted into the N.E.C.A. since the publication of the list in the August issue:

ALABAMA

Birmingham:
Simmons Elec. Co.

Montgomery:
Capitol City Elec. Co.
Dixie Elec. Co.
G. T. Key Co., Inc.
Mosley Elec. Co.
Service Elec. Co.
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CALIFORNIA

Burlingame:
Medley Elec. Constr. Co.

Fresno:
Bellevue Elec. Co.
Colley Elec. Co.
A. A. Dorfmeier
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Electric Motor Shop
Fresno Elec. Co.
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Hendee Elec. Co.
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Independent Elec. Co.
Inland Light Co.
Lewis Elec. Co.
S. C. Ramage
Robinson Elec. Co.
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Mill Valley:
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Napa:
Earl G. Wilson

North Sacramento:
E. M. Miller

Oakland:
California Elec., Ltd.

Sacramento:
California Eng. Co.
E. L. French
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Clifford Prudhomme
Jack W. Thomas
Carl F. Vining
Waxon Brothers

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(over)

3 YEARS *of* EMPTY INDUSTRIAL CUPBOARDS

...*have built you an enormous market!*

Since 1930, Industry has been "doing without." It has done without new equipment . . . supplies . . . even maintenance items that are positively necessary. Its cupboards are empty.

Today, the President is mobilizing Industry for action. Men are going back to work. Wheels are turning . . .

The years of skimped buying have created an enormous vacuum. That vacuum in turn has created an enormous market for alert electrical contractors. It means a *new opportunity* to sell better signalling, lighting, motors and control. More adequate wiring. For example:

Signalling...Adequate signalling equipment saves time and money. Lowers cost ...Hence—signal call, interior telephone systems, watchmen's calls, tank alarms and other signalling equipment *can be sold* today if you survey your prospects and *plan* a real sales effort.

Lighting...4 out of 5 industrial plants are logical prospects. 12,000 industrial plants were recently surveyed. 54 per cent *had obsolete equipment.* Another 25 per cent had modern equipment, *but inadequate intensities.* How many of these are in your sales area? List them. *Plan* a sales campaign. Concentrate—*Sell!*

Motors and Control...New motors and new control are needed in unusual numbers to meet increased production schedules. Find out where they're needed.

Wiring Supplies . . . Recovery will require modernization . . . re-wiring . . . eventual expansion. Wiring supplies from Graybar are *dependable.* Dependable work makes satisfied customers...future sales.

PLAN. Map out your "recovery territory." Plan. Sell! *Get your full share of the fall business. Mail coupon.*

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Room 1501, Graybar Building, New York, N. Y.
Gentlemen: Please send me information on a "Planned Sales Effort for More Industrial Business", and specific facts on your equipment checked below:

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☐ Motors and Control ☐ Wiring Supplies

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San Rafael:
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Yreka:
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Service Elec. Co.
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Tallahassee:
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West Palm Beach:
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Wetter Elec. Co.
L. G. White Elec. Co.

VIRGINIA

Richmond:
Edgar M. Andrews
Alex L. Bear
W. H. Jenks
W. R. Nehlett
Schermerhorn Elec. Co., Inc.
Stringer Elec. Co.
Union Elec. Co.

WASHINGTON

Spokane:
Austin-Henderson Co.
Electric Smith
Oliver Elec. Co.

Tacoma:
Ajax Elec. Co.

WISCONSIN

Kenosha:
Brenner Elec. Co.
Forbes Elec. Co.
Josephson & Zimmerman Co.
Speaker-Sinnott Elec. Co.

Madison:
Capital Elec. Co.
Electric Supply Co.
Harloff Elec. Co.
Schaub-Bradford Elec. Co., Inc.

Milwaukee:
Graham Elec. Co.
Al Schulz & Son Elec. Co.
Sorgel Elec. Co.
Uihlein Elec. Co.

CANADA

Verdun, Quebec:
W. B. Cartmel & Son, Ltd.

UMI

Step out of the price rut

WITH

MAGNALUX FIXTURES

for residential lighting

SO often you see advertisements featuring *complete wiring with fixtures* for $40, $35, even $30.

Will you try to match such competition, dollar for dollar, in an unprofitable price war? Or will you take the more profitable course—selling quality fixtures and adequate illumination?

Fixtures bought on price alone cannot meet the really important requirements for good lighting: Smart appearance, effective light distribution, high efficiency, low maintenance and correct design.

You can give your customer all these advantages ... and more ... if you standardize on Magnalux luminaires. You can give them soft, diffused light that is free from the glaring brightness or irritating dark spots that cause eye-strain and fatigue. You can give them a distinctive, beautiful fixture that, lighted or unlighted, enhances the appearance of their homes.

Get full information today on this attractive luminaire that will enable you to meet and beat price competition. Please use the coupon.

**Twilight Zone—That deceptive half-light between obvious darkness and adequate illumination.*

Westinghouse

Quality workmanship guarantees every Westinghouse product

Above—New Magnalux luminaire, for residential lighting, designed specifically for the home.

BETTER LIGHT BETTER SIGHT

Right—Use this slogan to identify yourself with the nation-wide fall lighting campaign sponsored by the Edison Electric Institute.

Make This Test for the Twilight Zone*

Take a 'phone book into your prospect's home. Open it at random. Can you read rapidly and without effort? You should be able to do so readily—for the telephone book is scientifically designed for perfect legibility under proper light. If you can't—if you have to squint and draw the book closer—your prospect has Twilight Zone lighting.

SEND FOR INFORMATION

Westinghouse Electric & Manufacturing Company
Room 2-N—East Pittsburgh, Pa.

Gentlemen: Send me information on Magnalux Lighting for residences.

Name .....
Company .....
Position T79736
Address ..... EC 9-33

CONTRACTING news

INFORMATION OF INTEREST TO ELECTRICAL CONTRACTORS CONSISTING OF ITEMS OF NEWS, SHORT ARTICLES, PRACTICAL IDEAS, ETC., OUR READERS ARE INVITED TO CONTRIBUTE TO THIS DEPARTMENT

ELECTRIC SHOPS TO COME UNDER RETAILERS' CODE

Retail store departments conducted by electrical contractor-dealers will come under the retailers' code while the contracting department of the business will come under the electrical contractors' code, according to an N. R. A. ruling.

The administration also placed the installation and repair of motors and other electrical equipment under the electrical contractors' code. Where a dealer sells motors but does not install them he comes under the retailers' code. Thus motor repair shops will be regulated by the electrical contracting code.

DENVER USES CARDS TO FIGHT BOOTLEGGING

As a further part of its program to stamp out the bootlegging of wiring, the Denver city electrician has had printed a series of warning signs and tags for use on properties that have been reinspected.

Tags are provided for overloaded installations and carry the words, "Do not make any addition to this installation until corrected." These cards are dated and signed by the deputy inspector.

A red tag is to be placed on all ground connections warning the public not to interfere with the connection and to notify the department if disconnected.

The warning cards which read as follows are expected to reduce the amount of bootleg wiring: "For the protection of life and property. It shall be unlawful for any owner, contractor or workman, not holding a license, to do any electrical wiring whatsoever, in or on any building in the City and County of Denver. Before any electrical work is done in this building, permit must be obtained from the Chief City Electrician. Do not remove this card."

MANUFACTURERS' CODE KILLS CHISELING

The electrical manufacturers' basic code of fair competition was signed by the President on August 4 and became operative on August 15. Divisions of the electrical manufacturing industry may work out supplemental codes covering their particular problems.

The basic code provides that manufacturers shall not sell below cost and that where it has been the practice to issue printed net prices, or price-lists and discount sheets, and fixed terms of payment, the manufacturers shall file their printed lists within 10 days with N. E. M. A., a copy of which N. E. M. A. is to send to each competitor.

If a manufacturer wishes to revise his printed prices he must file the revision 10 days in advance with N. E. M. A. which shall send a copy to each competitor, who may file revisions of their prices effective upon the date the first revision was to go in effect.

Where it has not been the general practice in any branch of the industry to issue such sheets N. E. M. A. shall determine the advisability of so doing.

"No employer," states the code, "shall sell directly or indirectly by any means whatever any product of the industry covered by the provisions of this Article (i.e. with printed lists) at a price lower or at discounts greater or on more favorable terms of payment than those provided in his current net price-lists or price-lists and discount sheets."

FLORIDA TO COORDINATE INDUSTRY CODES

At an industry conference held by the executive committee of the Florida Association of Electrical Contractors and Dealers during its convention at Orlando, August 20 and 21, three members each from the ranks of the utility men, manufacturers' agents, wholesalers, motor repair men and contractors were appointed as a committee to meet as soon as all electrical codes are approved to coordinate them in their application in Florida.

At the contractors' state meeting more than 50 percent of all of the contractors in the state were represented. After a full business day the meeting concluded with a banquet at the Orange Court Hotel. The officers of the association state emphatically that it was one of the best meetings ever held in Florida.

LIGHTING DRIVE GETTING UNDER WAY

The great drive on lighting which is expected to get under way in a great many cities the first week in October will operate under the slogan "Better Light—Better Sight." Eyesight conservation is to be the major objective.

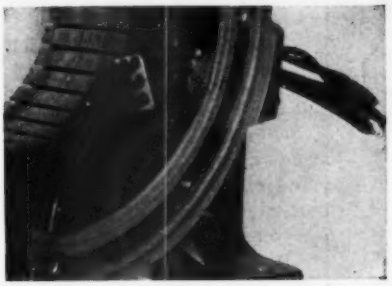
Many local campaigns are being planned to unite the local industry in a combined effort to sell better lighting. While the campaign is being sponsored nationally by the Edison Electric Institute the activity is to be purely local in determination and plan.

N. J. CONTRACTORS TO START ELECTRICAL DEVELOPMENT PLAN

At the quarterly meeting of the New Jersey Council of Electrical Leagues held at the Berkeley-Carteret Hotel, Asbury Park, on July 14, committees were appointed as the first step toward the inauguration of a state-

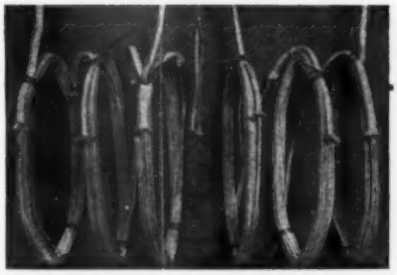
UMI

To give your customer something more-

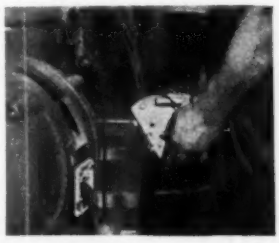


Sealed in leads. Through an opening in the frame—and there anchored permanently with a special sealing compound. The roughest kind of service during installation or afterward cannot put strain on the field connections.

Special cuff insulation. Empire cloth inside of two special pre-formed fibrous sheets is inserted in the stator-core slots. An ingenious method of folding makes self-locking cuff and gives permanent protection from slippage and gives added protection to the windings.



Group wound coils. A phase group winding from one piece of wire—reduces stub connections and eliminates a source of mechanical failure. Lead connections from these phase windings are WELDED, not soldered or brazed. An innovation in field construction that keeps motors out of the repair shop.



Every motor is given a thorough vibrometer test to make sure of proper dynamic balance. Eliminate vibration and you reduce to a minimum the wear on bearings. Sealed-ball bearings and smooth running insure trouble-free service from F-M Motors under severest operating conditions.

SURE! You can do a good job of figuring an installation. And you can do a fine job of putting in electrical equipment, too.

But as an electrical contractor, hasn't your customer a right to expect far more than these?

On motors for example: Your customer can buy by trademark as well as you can. But he expects *you* to be motor-*wise*. He expects *you* to know motors from the shaft to mounting feet. And your customer expects your counsel in getting him the most for his money.

So we present to you, as an electrical contractor, a few of the improved methods of building you will find in Fairbanks-Morse Motors. They are the kind of features that will appeal to a man like yourself, who has seen where most motors break down.

We invite your inspection of the column at the left. Your name and address will bring the complete story in a descriptive bulletin. Fairbanks, Morse & Co., 900 S. Wabash Ave., Chicago. 32 branches at your service throughout the United States.

FLEX-MOR DRIVE
Use Flex-Mor for troublesome short-center drives. Replace long-center drives and conserve space while reducing transmission losses. Flex-Mor is durable; the silent, elastic drive reduces bearing pressures and requires no dressing or lubricant; unaffected by dust, dirt, moisture or atmospheric conditions.

FAIRBANKS-MORSE
MOTORS

F-M POWER PUMPING AND WEIGHING EQUIPMENT

5727—EA 40.48

UMI

MURRAY
SAFETY SWITCHES

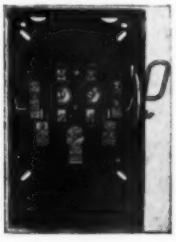
Easy Wiring is Characteristic!

Here are examples of 30 amp.
APPROVED
ACCESSIBLE FUSE TYPES

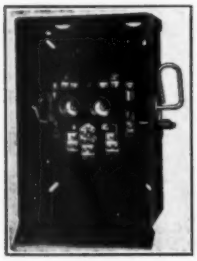
From "On" to "Open Door" Position is One Operation

"Open Door" Position

"On" Position



30 Amp.—3 Pole—2 Fuse
Solid Neutral—125-250 V
Sequence
Switch—Meter—Fuse



30 Amp.—3 Pole—2 Fuse
Solid Neutral—125-250 V
Sequence
Switch—Fuse—Meter

Send for Catalog of
METER SWITCHES, RANGE SWITCHES,
FUSED AND UNFUSED SAFETY SWITCHES

METROPOLITAN
DEVICE CORPORATION
1250 ATLANTIC AVENUE
BROOKLYN · NEW YORK

wide electrical development plan which will probably start in September. It is expected that this plan will result in industrial and residential remodeling along electrical lines in various parts of New Jersey.

FORM LEAGUE TO FIGHT INFERIOR WIRING MATERIALS

On July 25 twelve electrical contractors and dealers met and formed the Ellenville (N. Y.) Electric League and elected Russell Walker, general manager, and Courtland VanGorder, secretary.

The purpose of this new organization is to give better service to the public, and to protect the public from any inferior wiring materials.

Those present were Russell Walker, Jack Miller, Julius Tannenbaum, Courtland VanGorder, Henry Seymour, Joseph Levine, Martin Spiro, H. R. Evans, Walter Sarine, Kramer and Kritzer of Ulster Heights and Earl Tice of Leurenkill.

EIDLITZ CODE DIRECTOR FOR N. Y. CONTRACTORS

Charles L. Eidlitz, first president of the National Electrical Contractors Association, has virtually become the "czar" of New York City electrical contractors, having been appointed director of the Electrical Contractors Association with wide powers under a new Code of Rules.

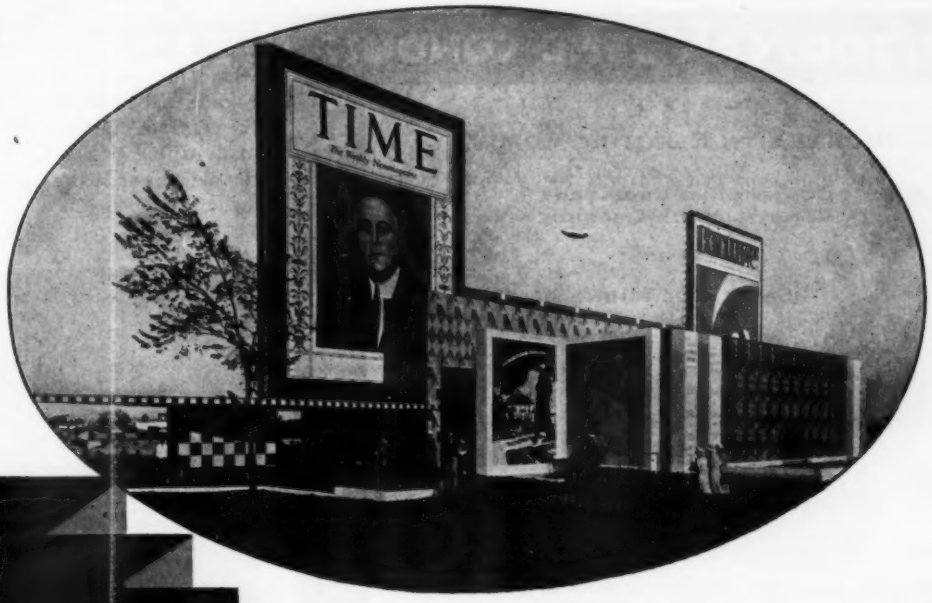
The association has voted to adopt the N. R. A. code for electrical contractors when finally signed by the President and under the National Code to govern the conduct of members by a local code of rules.

The power to administer the national and local codes has been delegated to the director who, with seven members, shall constitute an industry code committee to which the director is to report his findings.

A self-sustaining cost finding agency has been set up under the management of the director.

The director may require quantity take-off of labor and materials on all estimates amounting to $250 or more for checking before final estimates are made. If error is discovered the member is to be notified and he shall make the proper correction.

The director may require members



STEELTUBES LEADS AGAIN IN THE "MARCH OF TIME"

Millions of foot-weary visitors at A Century of Progress have gazed, wondering and admiring, at the TIME-FORTUNE Building, right in the middle of the surging excitement of what seems to be another world. They see it as one of the finest examples of modern architecture —they see its boldness of design—its brilliant color—but there's more to it than appears to the eye.

In the wiring of this inspiring building the electrical conductors are enclosed in Steeltubes, making it equally as modern in its hidden electrical construction as it is in appearance.

Steeltubes is the modern threadless rigid conduit. Cold rolled strip steel, formed to a round, is electric resistance welded to produce this conduit that bends easily, requires no threading, saves time in installation, yet affords the same degree of mechanical and electrical protection as old-style heavier conduit.

The TIME-FORTUNE Building is emblematic of a trend in construction which electrical wholesalers and contractors will do well to note. Detailed literature and prices on request.

THE MODERN THREADLESS RIGID CONDUIT

Steeltubes

Electrical Division

STEEL AND TUBES, INC.

WORLD'S LARGEST PRODUCER OF ELECTRICALLY WELDED TUBING

CLEVELAND • • • OHIO

A UNIT OF REPUBLIC STEEL CORPORATION

UMI

YOU, TOO, CAN BEND CONDUIT QUICKLY AND EFFICIENTLY

COMMONWEALTH ELECTRIC COMPANY

CONTRACTING ENGINEERS
CONSTRUCTION DIVISION

417 BROADWAY

SAINT PAUL, MINN.

May 19th, 1933.

Greenlee Tool Co.,
Rockford, Illinois.

Gentlemen:

We have owned and used one of your hydraulic conduit benders for two years, and can truthfully say that it is one outstanding tool in the Shop that has been a factor in saving time and money.

The more our men use it, the better they like it. It helps them to do a bending job quickly and efficiently.

Yours very truly,
COMMONWEALTH ELECTRIC CO.,

By Ralph C. Schorr

PCS:RT.

READ Mr. Schorr's letter carefully. In few words he gives the real secret of why the Greenlee Hydraulic Conduit Bender has been so successful. From the standpoint of the user, there isn't much to be said beyond the statement that it saves time and money, and that workmen like to use it.

But why shouldn't it produce savings and why shouldn't workmen like to use it? It represents the business-like way of bending conduit, as compared to the makeshift way, the slow way, the back-breaking way. In addition, it saves many fittings and makes it easier to pull in wire and cable. Remember, too, it is readily portable.

Just use the coupon to obtain complete information. No obligation on your part, of course.

Greenlee Hydraulic Bender for rigid conduit. No. 770 bends 1¼ to 3-inch; No. 775 bends 2½ to 4½-inch. No. 770 can be equipped to bend thin-wall steel conduit in 1¼, 1½ and 2-inch sizes.

GREENLEE TOOL CO.
ROCKFORD, ILLINOIS

Please send information on Conduit Benders.

Name .....

Address .....

City .....

State .....

My Jobber is .....

..... 9-33

GREENLEE TOOL CO.
ROCKFORD, ILLINOIS

to file copies of all sealed bids and revisions thereof with some depository where they shall be kept sealed and confidential until after the letting of the contract. In case no complaint is made within two weeks of the award the file bids are to be returned to their makers unopened.

The director has full power to hear

Charles L. Eidlitz

complaints and may check records of members to satisfy himself that the codes are being adhered to.

Upon charges of unfair bidding the director may check estimates of all bidders, require submission of all data and call upon any member of the association, whether bidder or not, for information that will help him in arriving at a fair decision.

Where the director finds a member guilty of violating either the National or the local code, he shall report his findings and recommendations to the industrial code committee. This body, by a two-thirds vote, may recommend a penalty of censure, fine, suspension of membership or expulsion. To sustain charges and enforce a penalty a two-thirds vote of the membership is necessary.

The fines are as follows:

a.—For failure to pay scale of wages, a fine of ten times the total amount of proven deficiency.

b.—For failure to carry out working conditions a fine of $50.00 for first offense and for a further offense not to exceed $500.00 for each offense.

To make these rules binding upon the membership they are printed in

You Can Profit By Tying In Floodlighting With the Nation-Wide Lighting Campaign

HERE'S a chance to help the recovery program, and yourself as well. Light helps to build confidence. Floodlighting sales help to build your business. That's the story in a nutshell.

And you're going to have plenty of backing in your lighting efforts. The power companies all over the country, and the electrical industry, are concentrating their activities during October and November to promote the sale of light.

Advertising for You

Besides the actual business, a floodlighting job gives you valuable advertising. It's something that can't be hidden. Every night it shines as your advertising sign, helping to pull more business your way.

You Sell More Than Floodlights

Furthermore, you sell more than floodlights when you sell a floodlighting installation. There are a flock of valuable collateral materials, such as lamps, cable, poles, switches, fuses, secondary racks, and cable fittings, that go with them.

General Electric is coöperating through advertising and promotional work in this nation-wide lighting campaign. It offers you, further, the services of its illuminating engineers. They will gladly help you plan any kind of floodlighting installation. For their services, or for information regarding equipment, address the nearest office of the G-E Supply Corp., any G-E Sales Office, or General Electric, Dept. 6-201, Schenectady, N. Y.

WHERE FLOODLIGHTING IS NEEDED

Industrial Buildings, Yards, Loading Platforms — For Advertising, Protection, and Convenience

Construction Projects — To Guard Materials and Equipment, and to Make Necessary Night Activity Safe

Stores — For Advertising

Office Buildings — For Advertising

Apartment Houses and Hotels — For Advertising

Gas Stations, Roadside Stands — For Advertising and Convenience

Parks and Playgrounds — For Night Sports

Better Light, Better Sight

710-183

GENERAL ELECTRIC

"continuous process" conduit offers many ADVANTAGES

MANY contractors have commented on the cleanliness, the ductility, the easy-working qualities and the long life of Fretz-Moon Conduit. Naturally, careful selection of materials and skilled workmanship have much to do with producing conduit with such features, but the important reason is this: • The flat ribbon of steel from which Fretz-Moon Conduit is made is carried through a continuous furnace at a closely controlled rate of speed. Every inch of metal as it leaves the furnace is at exactly the same temperature as every other inch. Thus, no areas have an opportunity to become overheated or "burnt" and cause hard spots to make trouble in bending, cutting or threading on the job. Cleanliness is obtained by carrying the hot metal through the furnace on special supports above the dirt that must collect in any furnace. • The "continuous process" is controlled and used exclusively by Fretz-Moon—no other conduit is made in this way. Use Fretz-Moon in your next job and let it prove itself.

Steel and Tubes, Inc. • • Cleveland, Ohio
Exclusive Sales Agents

FRETZ-MOON Rigid conduit

FRETZ-MOON TUBE CO. ELECTRO GALV-ITE UNDERWRITERS' LABORATORIES INSPECTED
FRETZ-MOON TUBE CO. ENAMEL-ITE UNDERWRITERS' LABORATORIES INSPECTED
FRETZ-MOON TUBE CO. HOT DIPPED GALV-ITE UNDERWRITERS' LABORATORIES INSPECTED CONDUIT MFG. BUTLER, PA.

pamphlet form and when signed and acknowledged by a notary, constitute a contract between the member and the association.

CONTRACTORS WIN DIVISIONAL PRIZES IN RANGE CONTEST

The judges in the New Victory Electrical Range Contest which was conducted nationally during April, May and June awarded neon signs as prizes to the divisional winners in the range dealers contest to electrical contractor-dealers in every district but one—New England.

The divisional winners are as follows:

New England Division, The Wallace Company, Pittsfield, Mass.; Great Lakes Division, Leidy Plumbing & Electric Co., Milwaukee, Wis.; Southwestern Division, Spurrier's, Inc., Oklahoma City, Okla.; North Central Division, A. S. Dunning, Inc., Duluth, Minn.; Pacific Coast Division, Guilbert Brothers Electric Co., San Jose, Calif.; Southeastern Division, R. S. Montgomery, Inc., Richmond, Va.; Eastern Division, Rohrer Electric Co., Inc., Niagara Falls, N. Y.; Northwest Division, Oakley & Sons, Boise, Idaho; Rocky Mountain Division, Rhueff Electric Co., Pueblo, Colo.

TO PROTECT CONTRACTORS ON LIGHTING EQUIPMENT SALES

A Trade Relations Code has been adopted by the Electrical League of Pittsburgh for the purpose of improving lighting equipment sales wherein the contractor is protected as to class of customer and margin.

The Pittsburgh electrical industry recognized the injustice of the situation that permitted business concerns to purchase lighting equipment at virtually the contractor's cost. The principles which the league adopted follow:

1. Wholesale Sales:—Sales at wholesale prices or solicitation by wholesale outlets (electrical manufacturers and jobbers) should be made only to (a) electrical contractors and fixture dealers, (b) business concerns which have electrical departments in charge of a qualified engineer or electrician, such as industrials, department stores, office buildings, etc., and (c) chain organizations maintaining central purchasing departments, such as the chain grocery and drug stores, the large gasoline and oil companies, etc.

2. Retail Sales:—Sales to consumers

HERE'S THE WAY TO SETTLE THE TAPE QUESTION?

If there's any question about the best tapes to handle just check off these points before you come to a decision:

1 In their basic quality of adhesiveness and tensile strength are they equal or superior to all other commercial tapes on the market?

2 Is the reputation of the manufacturer so well established there can be no question about continuous delivery?

3 Are the tapes wrapped and sealed in any way to keep them fresh and snap up their appearance?

4 Is there anything to distinguish the tapes when a roll is partly used?

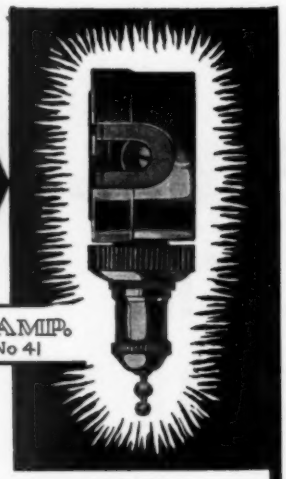
5 Are they packed in the most attractive way you know to help you sell them?

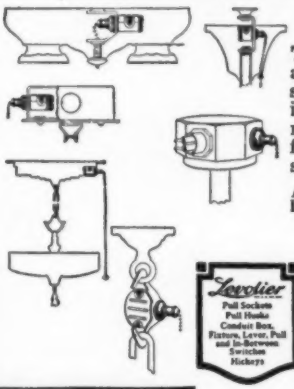
6 Are they distributed nationally and can the Electrical Contractor buy them from wholesalers?

THE ANSWER IS "YES" for PANTHER Friction and DRAGON Rubber TAPES!

HAZARD INSULATED WIRE WORKS
Division of
THE OKONITE COMPANY
Factories: Wilkes-Barre, Pa. Passaic, N. J.

Levolier
THIN MODEL
WINS!
—where Service and Adaptability Count





The Levolier Thin model Switch No. 41 is an achievement in small switches. The above actual size picture shows it is less than 5/8 of an inch in thickness. . . In spite of its smallness, it retains all of the practical characteristics of the famous Levolier line. It is the smallest 6 amp. switch made.

At the left are shown six logical uses for this practical Levolier, which may be secured in three different stem lengths.

You'll make no mistake in ordering these Levolier Thin Model Switches

Levolier Pull Sockets Pull Hooks Conduit Box, Fixture, Lever, Pull and In-Between Switches Hickeys

McGILL MANUFACTURING CO.
Electrical Specialties of Quality
ESTABLISHED 1904
VALPARAISO - INDIANA
Box No. 670

Lamp Guards Lamp Coloring and Frosting Soldering Flux Blow Torches Lamp Chargers

Short Days Soon!

Tie in with "better-light, better-sight" campaign NOW!

Your prospects will appreciate being reminded now—and you will get more business. Each job will be better planned, easier handled, more profitable, more satisfactory!

Show them how simple and practical it is to modernize their present lighting with

WIREMOLD
HARTFORD, CONN.

NRA MEMBER U.S. WE DO OUR PART

not included in the above should not be solicited by the manufacturers and jobbers except in cooperation with the electrical contractors and dealers. In such cases, quotations and sales should be made through the contractor or dealer and proper retail prices should apply. Solicitation of this type of customer is properly the function of the electrical contractor or dealer and this relationship should be encouraged and protected by the manufacturers and jobbers.

In unusual instances, where it becomes necessary for the manufacturer or jobber to quote prices to such customer, the prices so quoted should be such as to permit competition by the contractor or dealer on an equal basis.

3. Trade Discounts:—Schedules of discounts should be such as to place a proper differential between the prices quoted to the customer, the electrical contractor or the dealer and the jobber, sufficient to protect each branch of the industry in its dealings with its customers and to avoid unfair discrimination which would react to the disadvantage of either the manufacturer, the jobber, the dealer or the electrical contractor.

WAHLE HEADS BUFFALO CONTRACTORS

Richard Wahle of Johnson-Wahle Electric Co., Buffalo, has been elected president of the Associated Electrical Contractors of Buffalo, and James D. Robertson, vice-president.

PALM BEACH OFFICERS

The following new officers have been elected by the Palm Beach County (Fla.) Chapter:

President, H. J. Burkhardt, Burkhardt's Electric Shop; secretary, W. K. Webber, Webber Electric Company.

WHOLESALERS' CODE DEFINES WHOLESALING

A code of fair competition for the electrical wholesaling industry was adopted at the N. E. W. A. convention at Buffalo on August 14 to 17 for submission to N. R. A.

To qualify under the code as a wholesaler it is necessary that one (a) maintain and warehouse an adequate stock of standard electrical commodities sufficient to supply the trade, (b) maintain a show-room to properly display commodities for the benefit of the trade, (c) maintain a delivery service and facilities for pick-up service, (d) maintain a selling organization trained to promote, specify and quote on electrical commodities, and to properly handle

Obsolete Circuit Protection WASTES
THOUSANDS OF DOLLARS YEARLY
in the average Industrial Plant . .
DO you know what you are paying for circuit protection in your plant? How much is your fuse bill? How many hours do your men and machines stand idle while waiting for fuses to be replaced?
Single instances of blown-fuse delays may seem trivial in cost. But in a number of average plants, where actual investigations have been made and accurate cost records kept, this loss has been shown to amount to thousands of dollars in a year's time.
This waste is no longer necessary. The development of Westinghouse Nofuze Circuit Breakers has made fuse protection obsolete.
Check your costs this easy way!
Send for copies of the Fuse Check Book which makes it easy to keep an accurate record of this leak in operating expense that cuts into profits. In many cases it has been found that the money spent for fuse protection in even a month's time, or less, will pay for an installation of Nofuze Industrial Circuit Breakers.
Low-Cost Circuit Protection
with Nofuze Circuit Breakers
The Westinghouse Nofuze Industrial Circuit Breaker, which replaces the conventional fused safety switch, employs the "De-Ion" principle of arc extinction. Fuses are eliminated.
At negligible maintenance cost, it provides protection for motor and light circuits against short circuits and excessive overloads, because there is nothing to renew or replace.
When a short circuit or heavy overload occurs, the breaker opens the circuit in less than a hundredth of a second—so fast that destructive heating or burning of contacts cannot occur. Yet, its time-lag feature prevents service interruption from momentary overloads. And after the breaker trips, it can be reset and power restored by any workman within a few seconds.
The Nofuze Circuit Breaker is calibrated and sealed at the factory to prevent tampering or bridging. Underwriters' Laboratories have tested and approved it.
Westinghouse
Quality workmanship guarantees every Westinghouse product
LOW COST CIRCUIT PROTECTION
with NOFUZE INDUSTRIAL CIRCUIT BREAKERS
FUSE CHECK BOOK
SEND FOR BOOKLET!
This Check Book makes it easy to keep an accurate check on lost time and money caused by blown fuses in your plant. Send the coupon for a supply today and for a copy of the booklet, "Low-Cost Circuit Protection."

Above—*The first advertisement of the Westinghouse National Campaign on Fuseless Circuit Protection.*

STARTING this month with the double-page advertisement shown above and reaching more than 50,000 industrial plants all over the country, Westinghouse advertising will carry to your customers and prospects a specific cost-saving story on the advantages of Nofuze circuit-breaker wiring protection.

Make this advertising work for you! The campaign has been planned so that aggressive, sales-minded contractors can tie-in their efforts with it profitably. Every advertisement, every direct-mail piece, offers a check book that your customers can use to record their present circuit-protection costs. Correctly used, it will quickly show them how they can pay for circuit-breaker protection in a short time, with the money it saves.

This means circuit-breaker sales and wiring jobs for you! Don't pass up this opportunity. Send the coupon now for copies of promotion material.

Westinghouse

Quality workmanship guarantees every Westinghouse product

ELECTRICAL CONTRACTORS

Don't pass up the Creative Sales Help this Campaign offers

SEND FOR PROMOTION MATERIAL

Westinghouse Electric & Manufacturing Company
Room 2-N—East Pittsburgh, Pa.

Gentlemen: I am interested in your new plan for selling Nofuze Industrial Circuit Breakers. Please send me your circular and Fuse Check Book.

Name.....

Company.....

Address.....T 79687

City.....*State*.....EC 9-33

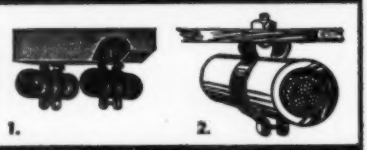
UMI

BURNDY
QIKLUG

Installed in a minute with only a wrench

BURNDY
ENGINEERING CO., INC.
305 EAST 45TH STREET, NEW YORK
Agents Everywhere

MINERALLAC
PRODUCTS



HANGERS FOR CABLES & CONDUITS

Easily the best for quick, low-cost installation work. Send for full details and costs.

1 Hanger without Porcelain Bushing. Spring steel; stronger, quicker, more compactly arranged.

2 Hanger attached to steel beam with bolt and nut.

3 Jiffy Clip—quicker, neater work at less cost.

4 Cable Joint or Pothead Compound—8 grades for every system, underground or overhead.

JIFFY CLIPS

Insulating Compounds

MINERALLAC ELECTRIC CO.
25 North Peoria Street, Chicago, Ill.

matters of service or misunderstanding with customers, (e) distribute catalogs showing and describing the most essential items in common use in the industry, and (f) extend justified credit to the buyers within his territory upon reasonable terms.

Under the matter of credits the terms for net sales are not to exceed the twenty-fifth of the month following the date of shipment. Cash discounts are not to be greater than the percentage allowed by the manufacturer.

CINCINNATI CONTRACTORS REELECT OFFICERS

At the annual meeting of the Cincinnati Electrical Contractors Association held August 14, Errett W. Edmonds was reelected president. Other officers reelected were Thos. J. Gleason, vice-president, and J. F. Riehle, secretary-treasurer.

The following were elected to serve as the board of governors: Charles P. Fisher, E. S. Kerchner, Thomas J. Donnelly, A. L. Racke and Howard Trout.

COOPERATION OF UTILITY WITH INSPECTOR RESULTS IN JOBS

The Public Service Co., Denver, Colo., is cooperating with City Electrician Malpiede in correcting defective wiring in Denver. Reports of defective wiring resulting in hazardous conditions are turned in to the company by the men who disconnect meters and answer service complaints. These reports are then given to the city electrician who has these properties reinspected and the owners are notified to have conditions remedied.

An average of about 50 defective wiring reports have been received each month so far as a result of this plan, resulting in wiring jobs for the contractors, averaging about $20 per contract.

LEON I. THOMAS

Leon Irving Thomas, vice-president and secretary of the Gage Publishing Co., New York City and editor of *Electrical Manufacturing*, died in Pocasset, Mass., on July 30 at the age of 49, after a prolonged illness.

SHERMAN
BAKELITE FIXTURE CONNECTOR

A Pigtail Joint without Solder or Tape

One size only takes any needed wire combination. Speedy, too—no special preparation of wires necessary.

Convenient in size—fits easily into smallest canopies—all wire held securely by screw wedged in "Vee" shaped opening.

No metal parts to cause shorts. Use the New Sherman Bakelite Fixture Connector.

Actual Size
U. S. Patent No. 1654660

Sold Through Jobbers

H. B. SHERMAN MFG. CO.
BATTLE CREEK, MICHIGAN

New easy way to make EXTRA MONEY

"We sold 15 elements the first week—we have installed Chromalox in nearly every stove in the city using open type elements," writes Correll Electric Co., Linton, Ind.

GO AFTER REPLACEMENT RANGE UNIT ORDERS with Chromalox Units Clapp & Leach sold 54 units in 4 weeks. Altoona, Pa. dealer made $136.50 in 2 months. Richmond, Va. contractor sold 48 units in 4 months, made $187.20 profit. Chromalox replacement units are a money-making depression-proof item. Range owners want to buy them. Easy to install, sizes to fit every make of range, old or new. Write for sure-fire sales plan already in use by dealers; Liberal discounts; free sales helps, etc. No obligation.

You can do it, too!

MAIL WITH YOUR BUSINESS LETTERHEAD TODAY!
E. L. Wiegand Co., 7585 Thomas Blvd., Pittsburgh, Pa.
Without obligation, send us complete data about Chromalox Super-Speed Replacement Range Units and how we can make money selling them. There are approx. ..... elec. ranges in the territory we serve. Check which ( ) We sell elec. ranges ( ) We do not sell elec. ranges. ( ) Send us catalogs about Chromalox-equipped electric ranges.

Signed.....*Position*.....

NEWS MANUFACTURERS

A DEPARTMENT FOR THE ANNOUNCEMENT OF ACTIVITIES OF MANUFACTURERS THAT ARE OF INTEREST TO CONTRACTORS, SUCH AS CHANGES IN EXECUTIVE PERSONNEL, BRANCH OFFICES, NEW PRODUCTS, ETC.

PALMER ELECTED PRESIDENT OF GENERAL CABLE

At a meeting of the board of directors held August 3, Dwight R. G. Palmer was elected president of General Cable Corporation, New York City, succeeding H. T. Dyett, who resigned.

Prior to becoming president, Mr. Palmer was vice-president and general sales manager of the company.

Dr. Frank M. Potter was elected vice-president at the same meeting.

BOX MANUFACTURERS GROUPED IN PATENT LICENSE

A. F. Erickson, vice president of the Roach-Appleton Manufacturing Company announces that this company has just completed patent licensing agreements with a group of leading manufacturers of electrical wiring materials. Some thirty patents and applications are included in the agreement, covering a wide variety of switch boxes, outlet boxes and accessories, embodying convenient and labor-saving features especially adapted to modern wiring installations.

The agreement provides for the maintenance of standards of quality and workmanship and for the maintenance of uniform marketing conditions as to the licensor and all licensees. It also provides a fund for the prosecution of infringements and the enforcement of provisions relating to marketing conditions.

To assist in administering the agreement, the company has appointed Raymond Mooney as technical advisor. His duties will include the co-ordination of the efforts of all interested parties in making the agreement most effective and beneficial. Mr. Mooney has been active in the electrical manufacturing industry since 1916 and was for a number of years connected with a manufacturer of electrical wiring material.

NEW YORK OFFICES OF GENERAL ELECTRIC MOVED

The General Electric Company and four of its associated companies announce the removal of their offices in New York City to the new General Electric Building, 570 Lexington Avenue at 51st Street. Included are the executive offices, New York district office, air conditioning department, electric refrigeration department, Atlantic division of the Incandescent Lamp Department, merchandise department and plastics department of the General Electric Company, and the General Electric Contracts Corporation, G. E. Employees Securities Corporation, General Electric Realty Corporation, and International General Electric Company, Inc.

New York City headquarters were formerly at 120 Broadway. Approximately 50 percent of the new building is occupied by the company.

FORSBERG APPOINTS SALES REPRESENTATIVES

The following sales representatives in the electrical field have been appointed by The Forsberg Manufacturing Co., Bridgeport, Conn.:

H. W. Bliven, 55 West 42nd St., New York City, to cover Greater New York, Westchester County and northern New Jersey; W. M. Landis, 1217 Race St., Philadelphia, Pa.,

RALCO

Explosion-proof Material for Class 1 Group D Hazardous Locations

New Bulletin No. 120-C covers our full and complete line of material required under Code Ruling for Service Station Gas Pumps.

RALCO MANUFACTURING CO.
125 N. Albany Ave., Chicago

Branch Offices:

Atlanta, Baltimore, Kansas City, Los Angeles, Boston, New York, Philadelphia, New Orleans, San Francisco, San Antonio

September New Products

Neon Electrode

Westinghouse Lamp Company, Bloomfield, N. J., announces an electrode for neon and other gaseous vapor signs, known as WL-760. Unit is coated inside with a special material which has a low electrode drop of potential. By contributing to a constant gas pressure throughout the life of a sign, the low operating potential of WL-760 electrode

gives constant color and intensity of light, and produces a high lumen output with a minimum of energy consumption. A lower starting and operating potential should mean that a maximum length of tubing can be used on a single transformer with greater operating efficiency. Low potential at electrode will also mean that fewer signs will be darkened as a result of arcing across the cathode during wet weather. Longer life of electrodes, made possible by their low potential drop, will also lower operating costs by reducing number of replacements.

Time-Switch

The Walser Automatic Timer Co., Chrysler Bldg., New York City, announces a utility non-stop motored time-switch. Specifications of unit include 30

amp., single pole mercury to mercury switch; self-starting a.c. induction motor and subsidiary spring power and jeweled escapement, all housed in a weatherproof aluminum case in mission bronze finish. Although switch combines the advantages of both motor and spring power, the manufacturers state that it is not a self-winding, but a strictly motor powered movement directly driven by a self-starting non-synchronous induction motor. Escapement is fitted with a solid tempered steel verge with dead-beat escapement; balance wheel is mounted in V jewels; all pivot points are sized, polished and burnished. Overall measurements are 9 in. high, 5 in. wide and 3 in. deep.

Explosion-Proof Switch

General Electric Co., Schenectady, N. Y., announces an oil-immersed, combination switch designated as CR7008, for use in Class I, Group D hazardous gas locations. Unit is available in three sizes for motors up to 50 h.p. at 440

volts. Combination switch consists of magnetic and motor circuit switches, and a thermal overload relay which is reset by a plunger extending through the top cover. These parts together with all connections, are located 6 in. below the surface of the oil in an oil-filled tank of welded heavy sheet steel. Tank is supported from top cover by 4 wing bolts with handles on the sides of tank. Motor circuit switch is a manual contactor with snap-action, quick-make, quick-break mechanism. Operating handle of motor circuit switch is interlocked with tank. Top cover of tank is a heavy iron casting and is provided with three threaded conduit entrances for line, motor and control connections. Cover also has lugs so that switch may be wall-mounted.

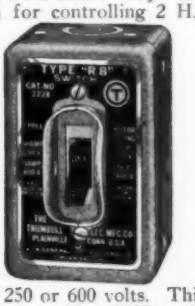
Photoelectric Relay

G-M Laboratories, Inc., Chicago, Ill., announces the FSE photoelectric relay using the Visitron F2 photoelectric cell which manufacturer states operates without external source of voltage and without amplification. In addition, the unit has a sensitive relay and an auxiliary electro-magnetic relay housed in a small, compact cast aluminum case 6¼ x 5⅛ x 4 in. Cell can be mounted behind a glass window in front of case or externally at

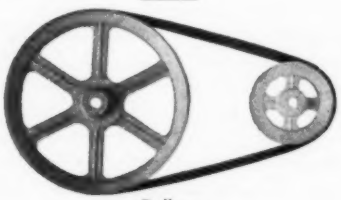
any point within hundreds of feet of sensitive relay. Unit can be completely weatherproofed. Unit also can be used in locations not served by electric power lines. F2 cells, auxiliary relays or two relays in combination can be supplied either assembled or individually as required for various electrical or photoelectric applications.

Tumbler Switch

The Trumbull Electric Mfg. Company, Plainville, Conn., announces the production of a 2-Pole and 3-Way "RB" Tumbler Switch for controlling 2 H. P. mo-



tors, either 250 or 600 volts. This switch, known as Cat. No. 2228, utilizes the roller-contact type of construction with quick-make and break action and supersedes Cat. No. 2221 which utilized the more conventional blade and jaw construction for making and breaking the circuit. The Switch unit known as Cat. No. 2228-S fits any standard wall box and has a bakelite case.



Pulleys

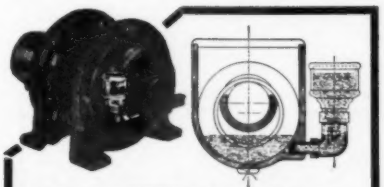
A series of pulleys in a variety of sizes, which are designed to accurately fit A and B type belts for power transmission needs is announced by The Congress Tool & Die Co., Detroit, Mich. The pulleys are die cast from white brass, diamond bored and balanced so as to eliminate vibration at high speeds.

to cover Pennsylvania, New Jersey, Delaware, Maryland and the District of Columbia; F. A. Bennett, 705 Donovan Bldg., Detroit, Mich., the state of Michigan; E. A. Quarfot, 4050 N. Larkin St., Milwaukee, Wis., Wisconsin and northern Michigan; A. E. Simon & Co., 323 W. Polk St., Chicago, Ill., northern Illinois and Indiana; K. A. Macomber, Electrical Sales Co., 3224 Walnut St., Denver, Colo., New Mexico, Colorado, Utah, Wyoming, southern Idaho and Montana, and R. E. Busch, 1123 Washington St., St. Louis, Mo., Missouri, Oklahoma, Kansas and southern Illinois.

SECOND DEMONSTRATION TRUCK FOR WIREMOLD

The Wiremold Company, Hartford, Conn., announces a second school on wheels this one for demonstration purposes in the south. The first demonstration truck has been used for many months on the Pacific Coast by George Gray, the Wiremold representative in the territory. Recently the truck was driven across country to the company's sales conference in Hartford. The success of this school-on-wheels encouraged the manufacturers to extend this form of demonstration.

Wagner Electric Corp., St. Louis, Mo., has recently published a new looseleaf bulletin sheet covering the subject of vertical motors. It illustrates and describes the three different types of vertical motors, and by means of illustrations of applications explains how horizontal-type motors can be mounted vertically.

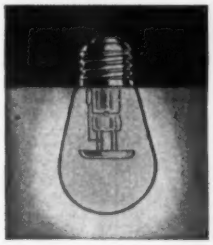


SpeedWay Oilers
End Maintenance Problems

SpeedWay Oilers make motor maintenance easy and profitable. Stop oil flooding, shorts and "frozen" bearings. End oil dripping and cut oiling time to a fraction. Keep motors running and customers satisfied. Profitable and easy to sell for they pay for themselves in oil saved.

30-Day Trial Plan Closes Sales.
Write for full description and list of leading plants now using SpeedWay Oilers

SpeedWay Manufacturing Co.
1840 So. 52nd Ave. Cicero, Ill.



2-Watt Bulb S 14 Finish — Clear Sprayed red or yellow

NEON GLOW LAMPS
stand by themselves

Neon Glow Lamps have these unique features: Low current consumption, distinctive color, rugged construction permitting their use at vibratory points without hazard, and a low level of illumination. New low prices have made them available for hundreds of uses which have been neglected because of the high cost of lamps heretofore available. Neon Glow Lamps may be obtained in a range of sizes from ¼ to 3 watts, and none of them costs more than a few pennies to operate continuously for a month! For complete information on uses, types, prices, write to General Electric Vapor Lamp Company, 867 Adams St., Hoboken, N. J.

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GENERAL ELECTRIC
VAPOR LAMP COMPANY
HOBOKEN, N. J.

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330 West 42nd Street, New York City.

Please send me, free of charge, your 1933 Catalogue and July 1 Supplement of McGraw-Hill Books. I want to know more about: (Name subjects of most interest to you)

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Name.....

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City..... State.....E C-9-33

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Do you play SAFE with the tools you buy? . . . .

The Improved

SUPER-GRIP

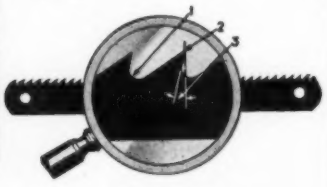
De Luxe Screw Driver

—you can't get a shock through its highly protective, non-inflammable, non-corrosive handle; you won't bend or break the chrome nickel molybdenum steel blade under actual service and you don't pay but a few cents more for it.

The next time your wholesaler's salesman calls, ask him to show you SUPER-GRIP—try it, test it, feel the non-slipping grip of that improved handle.

Why the Forsberg is the best hacksaw blade for your use:

1—Non-clogging large round gullet.
2—Keen, long-life cutting edge.
3—Less strokes with these undercut teeth.



Ask your jobber's salesman or write direct to

The Forsberg Mfg. Company
Bridgeport, Conn. Dept. C

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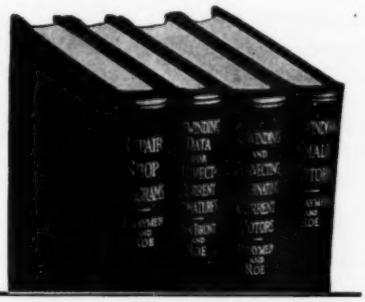

NOW—this

ELECTRIC MOTOR REPAIR LIBRARY

tells **how to handle all kinds of profitable repair and rewinding jobs**

Do you know how to:

—lay out a wave winding
—test a.c. and d.c. motors to locate grounds, shorts, opens, quickly and positively
—properly record data when stripping armatures so that it will be instantly usable for correct rewinding by yourself or any experienced winder at any time afterward
—determine how many coils can safely be cut out
—lay out single-phase fan motor windings
—change single-phase windings for two- or three-phase operation
—make cross or equalizer connections on lap windings
—lay out frog-leg windings
—handle every step in a rewinding job from the time it comes into the shop until it leaves
—wind stators for turbogenerators
—band high-speed armatures
—rewind motors for voltage, speed, frequency, or cycle changes
—etc., etc., etc.

1,079 pages of practical shop methods and data on jobs like these in this library. A complete, up-to-date key to repair of all motors. Nothing else in it; every page filled with definite, practical facts for the industrial maintenance man and the electric shop worker.

4 volumes, $10.00, payable in easy monthly installments

THIS set of books should be on the shelf of every man who ever has to touch a motor for purposes of repairing it or changing it to meet different operating conditions. In shop language and with practical shop methods it covers every step in stripping, rewinding and connecting a.c. and d.c. motors of all kinds.

How to change motors for different operating conditions

Here is all the information you need in order to determine what changes various types of motors permit; to lay out new windings for specified service conditions; and to handle every step in the work with satisfactory results.

Covers all types of motors, from those used in small household and commercial appliances of all kinds, to mining and railway motors. Explains principles underlying the different types of windings; gives definite instructions for doing the various rewinding jobs. Also gives many data, tables and diagrams constantly needed by the repair man, including data difficult to get from any other sources.

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Send Electric Motor Repair Library for 10 days' examination on approval. In 10 days I will send $2.00, plus few cents postage, and $2.00 monthly for four months, or return books postpaid. (We pay postage on orders accompanied by remittance of first installment.)

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Company..... EC-9-33

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Plymouth Tapes are the wholesalers' best salesmen because they win friends and build repeat business from electrical contractors who recognize the superior quality and service of Plymouth.

One trial by you, Mr. Contractor, makes you a regular user of Plymouth.

Wholesalers throughout the country who have a genuine interest in their contractor friends have introduced them to Plymouth. Electrical contractors throughout the country who want to save time and do better work regularly specify Plymouth.

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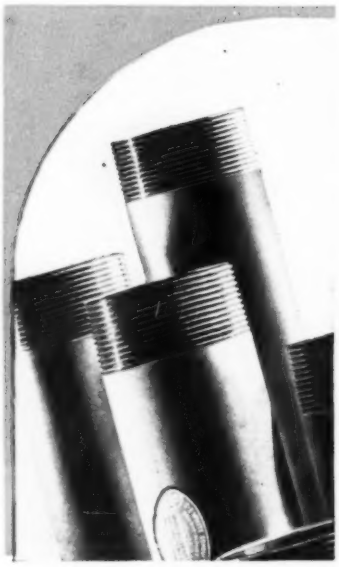
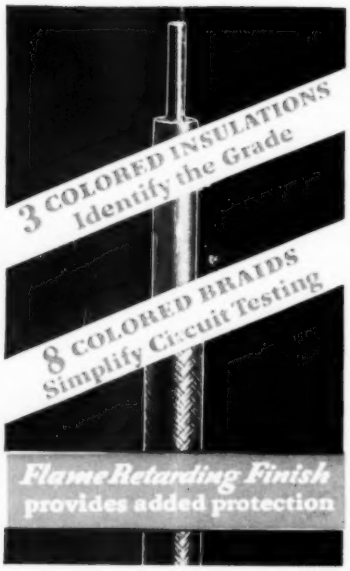


Use
G-E White Conduit for Permanent Wiring Protection

Only G-E White conduit has all seven protective layers which insure long life and dependable performance. Two layers of Glyptal — two layers of pure zinc, applied with the hot-dip galvanizing process — two layers of alloy and a center layer of flexible alloy steel. Seven layers of positive protection against oil, acid, water and alkali.

Despite this rugged construction, G-E White conduit is easy to bend and cut. It threads easily, too, and wires slip through the highly polished, smooth inner surface with little effort.

Ask your nearest G-E Merchandise Distributor about G-E White Conduit, or write Section CDW-209, Merchandise Dept., General Electric Company, Bridgeport, Conn.



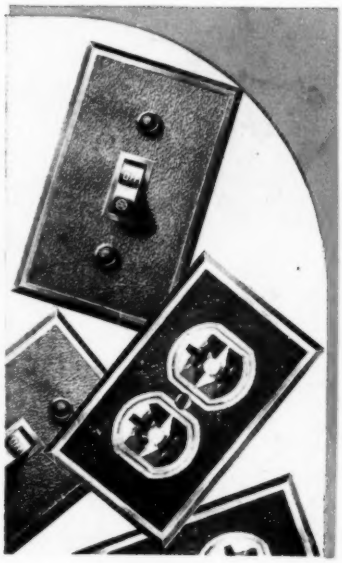
The
Economical— Safe Code Wire

General Electric Code Wires have FLAME RETARDING FINISH. This new finish provides the required protection against moisture and practically eliminates fire hazard. It will not support combustion and thus prevents flame from travelling along the braid.

The 3 grades of G-E Code Wire are self-identifying . . . Black rubber for Code, Red for Intermediate, and Green for 30%. Eight different colored braids facilitate circuit testing and save time on extensions and alteration work.

Overall diameters are uniform and the minimum allowed by the code. This permits a maximum number of wires per conduit. Braids are tough and smooth-finished to insure easy pulling.

Order the new G-E Code Wire from your G-E Distributor today, or write Section CDW-209, Merchandise Dept., General Electric Company, Bridgeport, Connecticut.



A Complete
Line of G-E Convenience Outlets and Plates

General Electric manufactures a complete line of high grade convenience outlets and plates. There are side and top wired, single or double convenience outlets, suitable for every requirement in home, industrial and commercial structure.

Wide mounting ears facilitate installation and assure perfect alignment of devices and plates in new and old work. Textolite construction, easy-finding slots, plain face and one-piece phosphor bronze contacts are other features which assure uninterrupted service and long life.

To finish an attractive job, always use G-E Textolite Plates.

See your G-E Distributor or write Section CDW-209, Merchandising Department, General Electric Company, Bridgeport, Conn.

GENERAL ELECTRIC
RIGID CONDUIT

GENERAL ELECTRIC
CODE WIRES

GENERAL ELECTRIC
WIRING DEVICES

MERCHANDISE DEPARTMENT, GENERAL ELECTRIC COMPANY, BRIDGEPORT, CONNECTICUT

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